

**Threatened and Endangered Species
Field Survey**

V.C. Summer Nuclear Station

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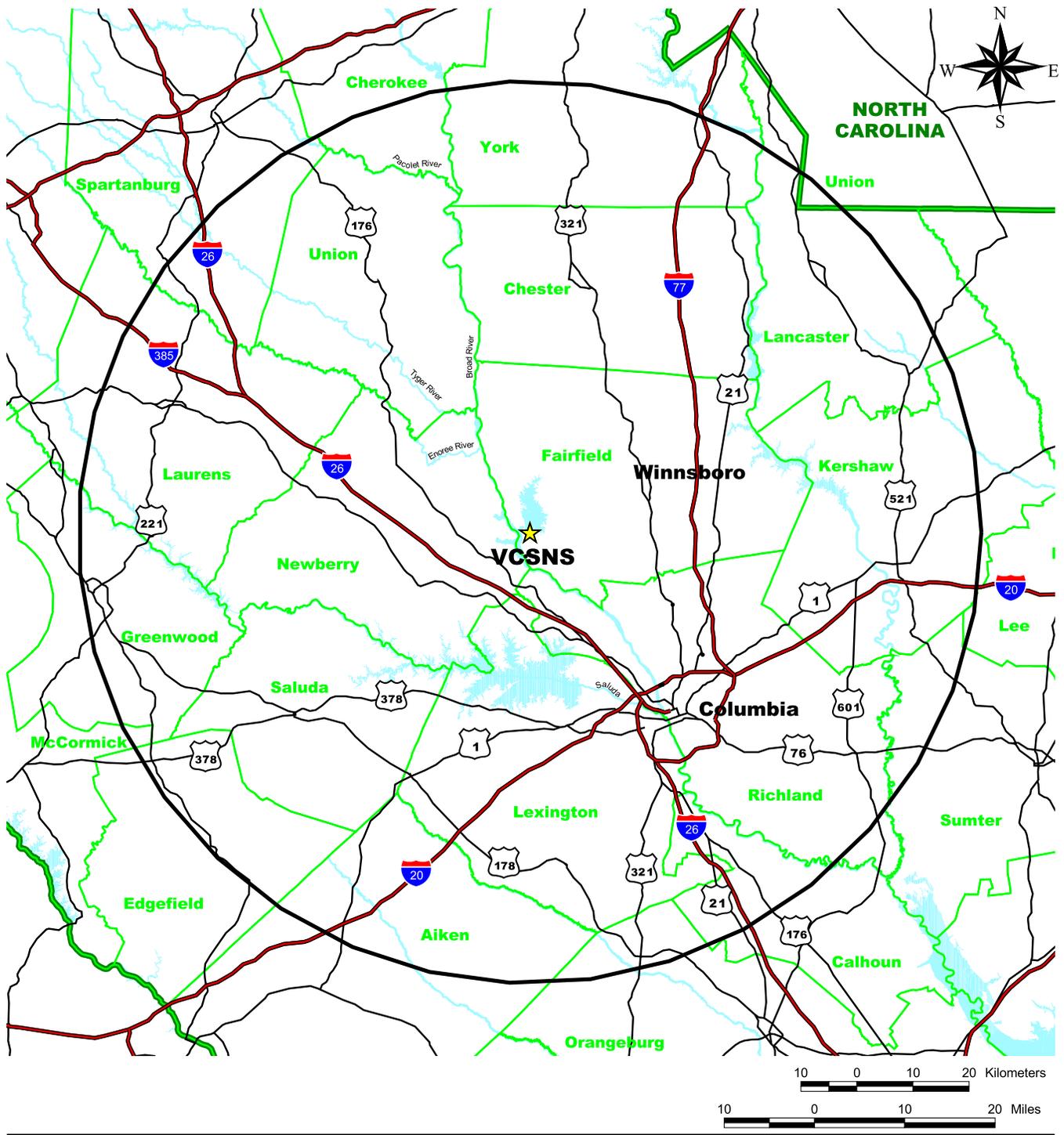
1.0 INTRODUCTION

In preparing for renewal of its operating license, V.C. Summer Nuclear Station (VCSNS) assessed a wide variety of potential impacts, including those to ecological resources, in an Environmental Report that was submitted to the U.S. Nuclear Regulatory Commission (NRC) on August 6, 2002 as part of a License Renewal Application. This *Threatened and Endangered Species Field Survey* presents the results of field surveys of the VCSNS site and associated transmission corridors conducted in late-spring (May) and summer (June, July, and August) 2002 to update information in the Environmental Report on ecological resources, emphasizing threatened and endangered species. Information obtained during the surveys will be used by the NRC in its assessment of the potential impact of VCSNS operation over the license renewal term on threatened and endangered species.

VCSNS is located in Fairfield County, South Carolina, approximately 15 miles west of the county seat of Winnsboro and 26 miles northwest of Columbia (Figure 1-1). The site is in a sparsely-populated, largely rural area, with forests and small farms comprising the dominant land use. The Broad River flows in a northwest-to-southeast direction approximately one mile west of the site and serves as the boundary between Fairfield County (to the east) and Newberry County (to the west).

VCSNS lies on the south shore of Monticello Reservoir (Figure 1-2), a 6,500-acre impoundment that serves as its cooling water source and heat sink. Monticello Reservoir was formed by damming Frees Creek, a small tributary of the Broad River that flowed into Parr Reservoir about 1.2 miles upstream of the Parr Shoals dam. Monticello Reservoir was designed to serve both as a cooling pond for VCSNS and the upper pool for the Fairfield Pumped Storage Facility, with Parr Reservoir serving as the lower pool.

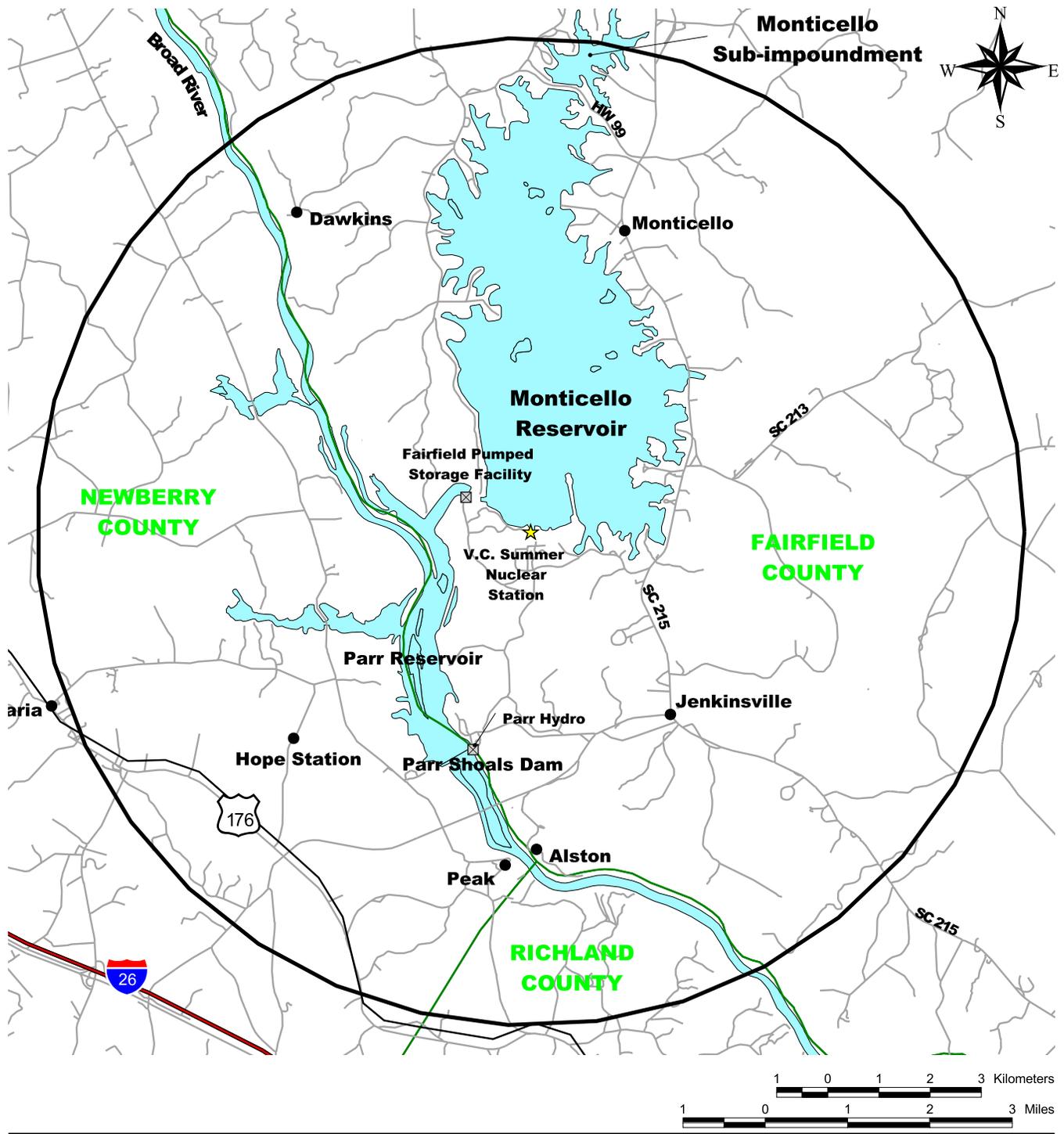
VCSNS is a single-unit pressurized water reactor plant with a once-through heat dissipation system. SCE&G operates VCSNS in accordance with NRC Operating License NPF-12, which expires August 6, 2022. VCSNS is a joint project between SCE&G, operator and two-thirds owner of the plant, and the South Carolina Public Service Authority (commonly referred to as “Santee Cooper”), owner of the remaining third.



LEGEND

- ★ V.C. Summer Nuclear Station
- 50 mile radius of V.C. Summer
- ▬ Interstates
- ▬ Major roads
- ▬ County Boundaries
- ▬ State Boundary
- ▬ Lakes and Rivers

FIGURE 1-1
V.C. Summer Nuclear Station,
50-Mile Locational Vicinity Map



- LEGEND**
- Six mile radius of V.C. Summer
 - Interstates
 - Major roads
 - Minor roads
 - County boundaries
 - Lakes and Rivers

FIGURE 1-2
V.C. Summer Nuclear Station,
6-Mile Vicinity Map

Data from this survey will support the environmental documentation required by NRC (10 CFR 51.53) that was submitted with the license renewal application. The purpose of the survey is broader, however, than the satisfaction of NRC requirements, which require applicants to assess potential impacts of the proposed action {license renewal} on only federally-listed species. As explained in Section 4.0 of this document, state-listed species are also included in accordance with SCE&G's corporate commitment to environmental stewardship. The following sections describe the survey area, present a "target list" of species of interest, describe survey techniques, discuss the results of the surveys, and suggest some factors that may influence the distribution and abundance (or absence) of special-status species in the survey area. The "survey area" is defined as the VCSNS site and associated transmission corridors leading to each corridor's first substation.

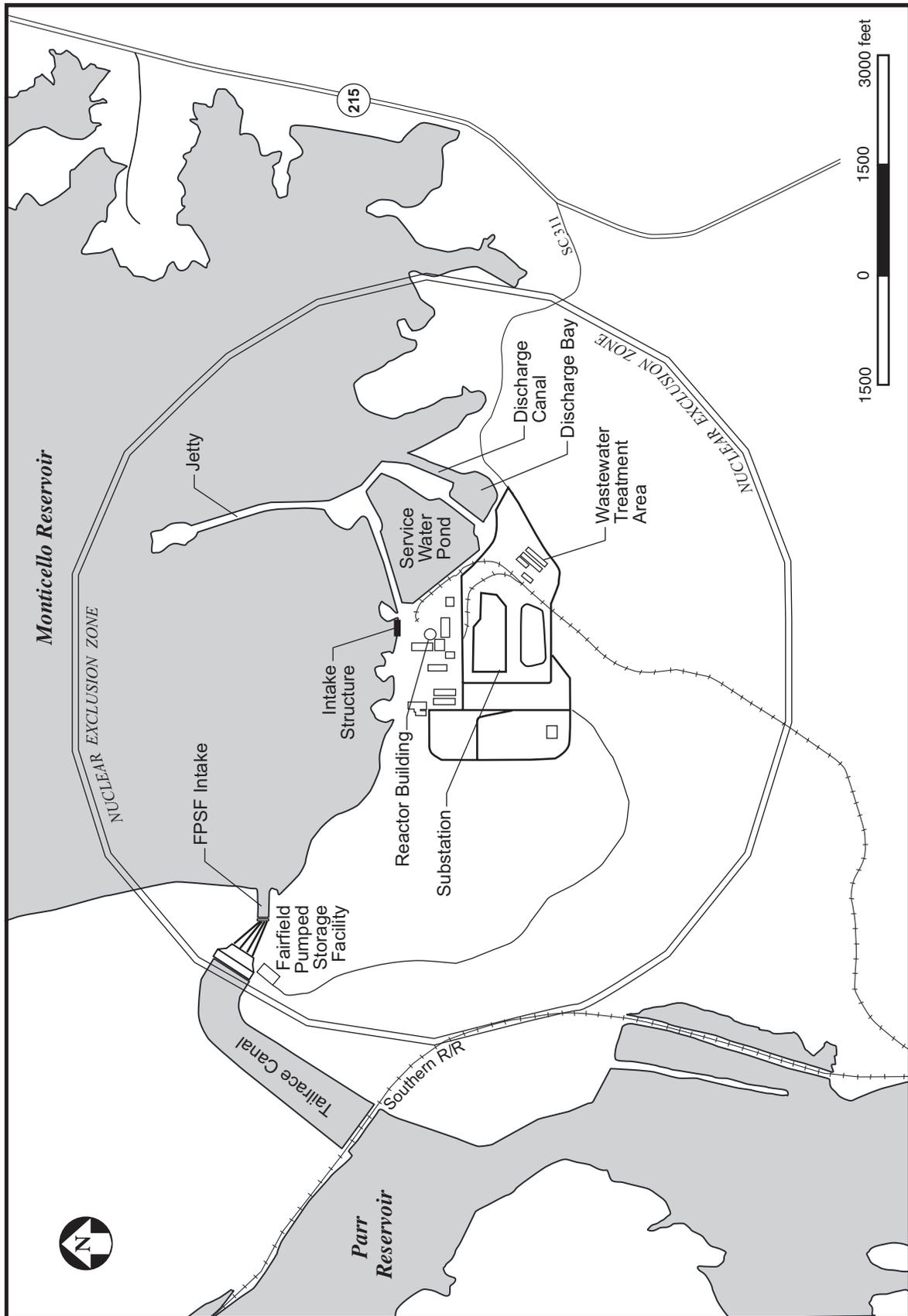
2.0 SITE DESCRIPTION

The VCSNS site covers approximately 2,200 acres, an area that includes portions of Monticello Reservoir and Fairfield Pumped Storage Facility (FPSF) (see Figure 2-1). Based on an examination of aerial photographs, approximately 860 of the 2,200 acres are covered by the waters of Monticello Reservoir. Approximately 370 acres consists of generation and maintenance facilities, warehouses, laydown areas, parking lots, roads, and mowed grass. Some 125 acres are dedicated to transmission line rights-of-way. However, much of the VCSNS property consists of forested areas (approximately 890 acres). The primary terrestrial habitats at VCSNS are pine forest, deciduous forest, and mixed pine-hardwood forest. The pine forests at VCSNS include planted pines and naturally vegetated pines. Most of the deciduous forests at the site are located along stream bottoms and on surrounding slopes. Streamside management zones at the site are protected in accordance with Best Management Practices established by the South Carolina Forestry Commission.

Forested areas within the 2,200-acre VCSNS site are managed by SCANA Services' Forestry Operations group, but timber is not routinely harvested. Timber has been harvested in the past to remove diseased trees and trees damaged by tornadoes and windstorms. Once timber is removed, these areas are replanted with tree species appropriate to the terrain, soils, and drainage characteristics of a site. Dry upland areas are normally replanted in improved loblolly pine.

Parr Reservoir, just west of the VCSNS site, provides some limited freshwater marsh habitat in shallow backwaters, around low-lying islands, and in an area east of the FPSF tailrace that was used in the 1970s for the disposal of dredge spoil (Figure 2-1). These marshes and adjacent shallows are used by migrating dabbling ducks, including mallard, black duck, and teal. Monticello Reservoir and its subimpoundment also provide resting areas for wintering waterfowl and provide year-round habitat for non-migratory Canada geese. SCE&G has been recognized by the South Carolina Wildlife Federation for its efforts in establishing a self-sustaining, non-migratory population of Canada geese on Parr and Monticello Reservoirs.

Terrestrial wildlife species found in the forested portions of the VCSNS property are those typically found in the Piedmont forests of South Carolina. Wildlife characteristically found in the pine forests and mixed pine-hardwoods of the Piedmont include toads (e.g., Fowler's toad), lizards (e.g., Carolina anole, fence lizard, various skinks), snakes (e.g., black racer, rat snake, ringneck snake), songbirds (e.g., cardinal, bluejay, towhee, various warblers), birds of prey (e.g., red-tailed hawk, red-shouldered hawk), and a number of mammal species (e.g., gray squirrel, eastern cottontail, raccoon, white-tailed deer).



M:\Util\Summer Station\Grfx\I&E 2-1 Sum Site.ai

Figure 2-1. South Carolina Electric & Gas Company, Virgil C. Summer Nuclear Station Site Area Map.

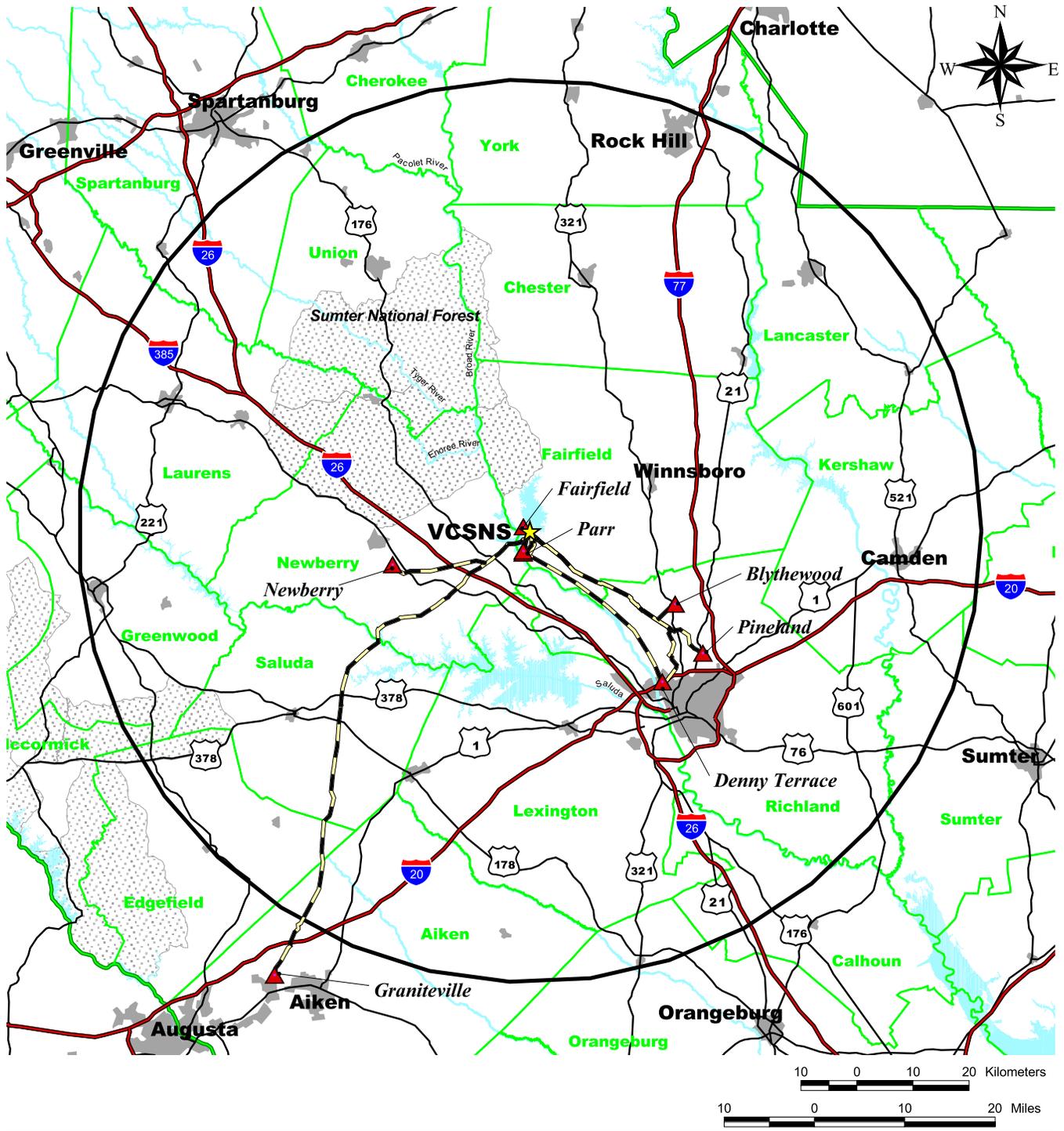
3.0 TRANSMISSION CORRIDORS

SCE&G built eight transmission lines for the specific purpose of connecting Summer Station to the regional transmission system. Two additional transmission lines were built by Santee Cooper, one-third owner of VCSNS, to connect the station to the regional grid. A pre-existing Duke Power Company line crosses the VCSNS site, but does not connect to the VCSNS switchyard or the SCE&G transmission system.

Beginning at VCSNS, the SCE&G transmission lines generally run in a southerly direction, with five terminations very near Summer Station, one near Aiken, South Carolina, and two near Columbia, South Carolina (see Figure 3-1). The Santee Cooper lines run approximately east and west to substations near Blythewood and Newberry, South Carolina, respectively. Originating in Fairfield County, the SCE&G and Santee Cooper transmission lines run through five other South Carolina counties: Aiken, Edgefield, Newberry, Saluda, and Richland.

The list below identifies the transmission lines by the name of the substation (or other structure) at which each line connects to the overall electric grid. The accompanying paragraphs provide other features of the transmission lines, including voltage, right-of-way width and length, and presence of other lines in the right-of-way.

- Summer-Parr No. 1 and No. 2 – These two SCE&G lines, which occupy the same 240-foot right-of-way to the Parr Substation, operate at 230 kilovolts (kV). The lines' lengths are each 2.3 miles. For approximately 0.5 mile, these lines share the corridor with the Graniteville line and Santee Cooper's Newberry line.
- Summer-Fairfield No. 1 and No. 2 – These two 230-kV lines provide power to and from SCE&G's Fairfield Pumped Storage Facility. The lines are only 1 mile long and occupy a 170-foot, wholly-owned corridor.
- Summer-Denny Terrace No. 1 – This 2.5 mile, 230-kV tie line connects Summer Station to the Denny Terrace No. 1 line near Parr, South Carolina, well north of the Denny Terrace substation. The line was built by SCE&G and occupies a 100-foot right-of-way.
- Summer-Pineland No. 1 – This SCE&G line provides power at 230-kV to the Pineland Substation six miles northeast of Columbia. The right-of-way width is 240 feet for the approximately 18 miles that the line shares the corridor with the Denny Terrace No. 2 line and then 100 feet for



- LEGEND**
- ★ V.C. Summer Nuclear Station
 - ▲ Substations
 - Transmission Lines
 - 50 mile radius of V.C. Summer
 - Interstates
 - Major roads
 - County Boundaries
 - State Boundary
 - Lakes and Rivers
 - National Forests
 - Major Urban Areas

FIGURE 3-1
V.C. Summer Nuclear Station,
50-Mile Transmission Line Map

the remaining 5.5 miles. Santee Cooper's Blythewood line parallels this line for approximately 17 miles.

- Summer-Denny Terrace No. 2 – This 230-kV SCE&G line to the Denny Terrace substation two miles north of Columbia follows the Pineland corridor for approximately 18 miles and then continues for approximately 7 miles in a 100-foot right-of-way. Santee Cooper's Blythewood line parallels this line for 17 miles.
- Summer-Graniteville – This SCE&G line provides 230 kV of power to the Graniteville Substation. The line is 62.5 miles long. For the first 0.5 mile, it runs with the Newberry and Summer-Parr No. 1 and No. 2 line. Then for 2.5 miles it parallels the Newberry line. For the remaining 59.5 miles, it is the sole occupant of the corridor. The right-of-way width is 170 feet as far as the Broad River and then 100 feet to Graniteville.
- Summer-Blythewood – The Blythewood line is owned by Santee Cooper. It is a 230-kV line that runs for approximately 20 miles, sharing the corridor with the Summer-Pineland and the Denny Terrace No. 2 lines for the first 17 miles. For the remaining 3 miles, the right-of-way is 100 feet.
- Summer-Newberry – This Santee Cooper line, which is approximately 18 miles long, operates at 230 kV and provides power to the Newberry Substation. For the first 0.5 mile, it shares the corridor with the Summer-Parr No. 1 and No. 2 and the Graniteville lines. For the next 2.5 miles it shares the corridor with the Summer-Graniteville line. For the remaining 15 miles, it occupies the 100-foot right-of-way alone.

In total, for the specific purpose of connecting VCSNS to the transmission system, SCE&G and Santee Cooper have constructed approximately 160 miles of transmission lines (120 miles of corridor) that occupy approximately 2,000 acres of corridor. The areas are mostly remote, with low population densities. The longer lines cross numerous state and U.S. highways, including I-26 and I-20. SCE&G and Santee Cooper plan to maintain these transmission lines, which are integral to the larger transmission system, indefinitely. These transmission lines are expected to remain a permanent part of the regional transmission system after Summer Station is decommissioned.

Most of the transmission corridors are situated within the Piedmont Physiographic Region, but the southernmost portions of the Summer-Graniteville, Summer-Denny Terrace No. 2, and Summer-Pineland corridors are situated within the Sandhills Physiographic Region. Most of the areas crossed by the transmission corridors are forestlands or agricultural lands (in pasture or row crops). Forest habitats along

transmission corridors consist primarily of pine forest, pine-hardwood forest, and bottomland hardwood forest. Transmission corridors that run west from VCSNS cross more agricultural lands (mostly pasture) than corridors that run to the east. Conversely, corridors that run to the east cross more forested lands and residential areas (northern suburbs of Columbia) than corridors that run to the west.

No areas designated by the U.S. Fish and Wildlife Service (FWS) as “critical habitat” for endangered species occur at VCSNS or adjacent to associated transmission lines. In addition, the transmission corridors do not cross any state or federal parks, wildlife refuges, or wildlife management areas.

The transmission corridors are maintained by mowing, trimming of undesirable vegetation from the sides of the corridors, and by use of approved herbicides. Under normal circumstances, the mowing and herbicide schedule follows a three-year cycle. Trees are “side-trimmed” every 10 years by helicopters carrying hydraulically operated saws. Aerial patrols of transmission corridors are conducted four times a year by SCE&G and twice a year by Santee Cooper. Dead and diseased trees at the edges of corridors are removed if it appears that they could fall and strike the transmission lines or support structures.

Periodic mowing in dry, upland portions of transmission corridors creates sunny, open conditions favorable for plants and animals normally found in fire-maintained ecosystems, such as successional grasslands and longleaf pine-wiregrass communities. Rare species found in these fire-maintained ecosystems in the southeastern U.S. include the smooth coneflower (*Echinacea laevigata*) and the gopher tortoise (*Gopherus polyphemus*). Permanent and seasonal wetlands along transmission corridors hold potential for harboring a number of other plant species currently listed by the FWS and South Carolina Department of Natural Resources (SCDNR), including the rough-leaved loosestrife (*Lysimachia asperifolia*) and Canby’s dropwort (*Oxypolis canbyi*). Wetlands also provide habitat for several listed animal species, and some species (e.g., the wood stork) are found only in wetlands. Many animal species, however, are highly mobile and utilize more than one habitat type. The transmission corridors provide an open canopy and offer an abundance of herbaceous ground cover. Thus, they can be natural avenues for movement and foraging by some animals.

SCE&G and Santee Cooper participate with the U.S. Department of Agriculture–Natural Resources Conservation Service, SCDNR, and other organizations in a wildlife management program for transmission line corridors. The “Power for Wildlife” program is designed to help landowners whose property is crossed by transmission lines convert transmission corridors into productive habitat for wildlife. The program offers grant money and wildlife management expertise to landowners who commit to participating in the program for five years.

4.0 METHODOLOGY

4.1 Species of Interest

For actions such as issuing permits and licenses, NRC has responsibility under the Endangered Species Act (50 CFR 17.11 and 17.12) to review such actions to determine whether they may jeopardize the continued existence of federally listed species or their habitats. The term “listed species” as used in this report includes the following:

- Species that the U.S. Fish and Wildlife Service (FWS) has listed as threatened or endangered in accordance with the Endangered Species Act. The U.S. Fish and Wildlife Service maintains (and frequently updates) lists of threatened and endangered species on the Endangered Species Program web (internet) site at <http://endangered.fws.gov/wildlife.html>.
- Species that the FWS has proposed for listing or made a candidate for listing under the Endangered Species Act. Lists of proposed and candidate species are also on the Endangered Species Program web (internet) site at <http://endangered.fws.gov/wildlife.html>.
- Species that the South Carolina Department of Natural Resources (SCDNR) Heritage Trust Program has listed as threatened or endangered. SCDNR maintains the “South Carolina Rare, Threatened & Endangered Species Inventory” (including county lists) on its website at <http://www.dnr.state.sc.us/etc/conservation.html>.

4.2 Target Species

Before going into the field, project biologists conducted a literature review to identify species known to occur in the counties crossed by VCSNS transmission lines. Previous research for the VCSNS Environmental Report (submitted to the NRC in August 2002) had shown that only one listed species, the bald eagle, was known to occur on the VCSNS site and there were no records of threatened and endangered species occurring along the station’s transmission corridors. The state and federally listed species known to occur in the counties crossed by VCSNS-associated transmission corridors are shown in Table 4-1. This list was based largely on information received from the FWS (see list, Appendix A, sent to SCE&G), the SCDNR Heritage Trust Program (see letter and list, Appendix A, sent to SCE&G), and the Heritage Trust Program’s protected database.

Although this species list was based primarily on information obtained from the FWS and SCDNR, a number of other sources and authorities were consulted, including *Manual of the Vascular Flora of the*

Carolinas (Radford et al. 1973), *Endangered, Threatened, and Rare Vascular Flora of the Savannah River Site* (Knox and Sharitz 1990), *Amphibians and Reptiles of the Carolinas and Virginia* (Martof et al. 1980), *Guide to the Reptiles and Amphibians of the Savannah River Site* (Gibbons and Semlitsch 1991), *South Carolina Bird Life* (Sprunt and Chamberlain 1970), and *Mammals of the Savannah River Site* (Cothran et al. 1991).

Table 4-1 was intended to serve as a “target list,” focusing the efforts of the field personnel. It was not, however, intended to restrict the survey’s scope to only these species. Any rare or unusual species encountered in the field was identified and characterized (its rarity and regulatory status determined), ensuring that previously unrecorded species were not overlooked.

Two state- and federally-listed aquatic species have been recorded in counties crossed by VCSNS transmission lines, but could not be affected by Station operations or transmission line maintenance over the license renewal term. The shortnose sturgeon (*Acipenser brevirostrum*), which SCDNR lists as occurring in Aiken County, is found in the Savannah River, which is not crossed by VCSNS transmission lines. Small numbers of shortnose sturgeon may also ascend the Congaree River from Lake Marion, but are blocked from entering the Broad River by a hydroelectric facility (Columbia Hydro) in Columbia. The Carolina heelsplitter (*Lasmigona decorata*), a freshwater mussel, is found in Turkey Creek and two of its tributaries in the Sumter National Forest in western Edgefield County. The Summer-Graniteville transmission line crosses a very small portion of eastern Edgefield County (see Figure 3-1), more than 15 miles from Turkey Creek and its tributaries. As a consequence, these and other aquatic species were not a part of the survey.

Table 4-1. Federal- and State-Listed Terrestrial Species Identified in S.C. Counties Crossed by VCSNS-associated Transmission Corridors.

Species		Federal status	State status	Habitat	County
Common name	Scientific name				
Mammals					
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	---	Endangered	Found in forested areas, especially pine flatwoods and pine-oak woodlands. Roosts in hollow trees, under bark, in old cabins and barns, and in wells and culverts.	Aiken, Richland
Birds					
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Endangered	Commonly observed foraging around large Piedmont and Coastal Plain rivers and reservoirs. More than one hundred nesting pairs in South Carolina.	Aiken, Edgefield, Fairfield, Newberry, Saluda
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered	Endangered	Nest in mature pine with low understory vegetation (<1.5m); forage in pine and pine hardwood stands > 30 years of age, preferably > 10" diameter at breast height	Aiken, Edgefield, Richland, Saluda.
Wood stork	<i>Mycteria americana</i>	Endangered	Endangered	Wood storks from the Birdsville Colony (near Millen, Georgia) feed in shallow wetlands on the Savannah River Site and at foraging ponds constructed at the National Audubon Society's Silver Bluff Sanctuary.	Aiken
Reptiles					
Gopher tortoise	<i>Gopherus polyphemus</i>	---	Endangered	Well-drained, sandy soils in forest and grassy areas; often associated with pine overstory, open understory with grass and forb groundcover, and sunny areas for nesting.	Aiken
Spotted turtle	<i>Clemmys guttata</i>	---	Threatened	Swamps, small streams, shallow ponds.	Aiken
American alligator	<i>Alligator mississippiensis</i>	Threatened (similarity of appearance)	Threatened	Swamps, ponds, lakes, slow moving streams and rivers.	Aiken, Richland
Amphibians					
Pine barrens treefrog	<i>Hyla andersonii</i>	---	Threatened	Swamps, streams, and acid bog areas	Richland

Table 4-1. Federal- and State-Listed Terrestrial Species Identified in S.C. Counties Crossed by VCSNS-associated Transmission Corridors (continued).

Species		Federal status	State status	Habitat	County
Common name	Scientific name				
Webster's salamander	<i>Plethodon websterii</i>	---	Endangered	North-facing slopes of moist, shaded hardwood forests in Piedmont with rock outcrops.	Edgefield, Saluda
Carolina gopher frog	<i>Rana capito capito</i>	---	Endangered	Upland, xeric areas used as shelter; seasonally flooded shallow ponds used as breeding habitat.	Aiken
Mollusk					
Carolina heelsplitter	<i>Lasmigona decorata</i>	Endangered	Endangered	Small-to-large streams in Piedmont with stable, shaded banks and clean sand or gravel bottoms.	Edgefield
Fish					
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	Endangered	Endangered	Large, sluggish coastal rivers and estuaries, but moving upstream in early spring to spawn in faster-flowing freshwater reaches.	Aiken
Plants					
Pool sprite	<i>Amphianthus pusillus</i>	Threatened	Threatened	Shallow vernal depressions and pools (less than 1 foot deep) assoc. with granite outcrops where water collects after rains. Piedmont.	Saluda
Georgia aster	<i>Aster georgianus</i>	Candidate	---	Open woodland borders, roadsides, in utility rights-of-way. Conspicuous, closely related to the common <i>Aster patens</i> , known to occur in study area.	Edgefield, Fairfield, Richland
Smooth coneflower	<i>Echinacea laevigata</i>	Endangered	Endangered	Meadows, open woodlands, roadsides. Most often found on circumneutral soils throughout its range (and in S.C. upstate), but may occur on sandy, acidic soils in Richland County (Fort Jackson).	Aiken, Richland

Table 4-1. Federal- and State-Listed Terrestrial Species Identified in S.C. Counties Crossed by VCSNS-associated Transmission Corridors (continued).

Species		Federal status	State status	Habitat	County
Common name	Scientific name				
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	Endangered	Endangered	Sandhills seepage bogs in S.C. midlands; one known population at Fort Jackson. Appears to be dependent on periodic fires.	Richland
Canby's dropwort	<i>Oxypolis canbyi</i>	Endangered	Endangered	Carolina bays. Rarely (in S.C.) elsewhere.	Richland
Harperella	<i>Ptilimnium nodosum</i>	Endangered	Endangered	Variable. In the northern part of its range, occurs on rocky river shoals. In the southern part of its range, including S.C., more likely to be found in Carolina bays.	Saluda
Relict trillium	<i>Trillium reliquum</i>	Endangered	Endangered	Mature, moist hardwood forests; in the Piedmont, found in either in rich ravines or adjacent alluvial terraces over mafic rock and/or circumneutral soils. In S.C., found only in certain stream bottoms along the Savannah River.	Aiken, Edgefield

5.0 SURVEY TECHNIQUES

The undeveloped portions of the VCSNS site were surveyed on foot. The transmission corridors, because of their size, were surveyed by concentrating efforts in areas offering the greatest potential for harboring listed species. Areas of interest were identified using USGS 7.5 minute topographic maps, county soil maps, and aerial photographs prior to conducting ground surveys. This initial “desk-top” survey allowed biologists to rapidly eliminate from consideration cropland, pastures, and other areas of poor quality habitat for listed species. Following this phase of the survey, biologists drove to areas of potential interest and conducted surveys on foot. The survey of the VCSNS site was conducted in late May 2002. Surveys of the corridors were conducted over the May-August 2002 period.

5.1 Plants

The VCSNS site contains substantial acreage of intact forestland (exclusive of planted pines), and an attempt was made to visit all forested sites, especially those featuring steep topography and stream drainages, since these would be expected to support the highest diversity of vascular species. Similarly, portions of transmission corridors with intact forests on one or both sides were presumed most likely to harbor rare plants.

A total of 75 locations representing more than 60 miles of transmission corridor were surveyed on foot. As noted earlier, most these sites were chosen based on terrain features (from topo maps), soils (from county soil surveys), land use in the area (from aerial photographs), and existing vegetation (from aerial photographs). Other sites were added due to proximity to known populations of threatened and endangered species. Several access points were locked/gated and thus inaccessible; these sites generally feature pastureland that otherwise offer little in the way of habitat for rare species.

Enlarged topographic maps developed from United States Geological Survey (USGS) quadsheets (7.5 minute series) and a hand-held Global Positioning System (GPS) unit were used to record the locations of areas that were searched. Notes were taken at each area searched describing habitats and plant species present. Field surveys involved careful study of all vegetation in each target area. In the case of problematic genera, specimens were collected for further study and placed in a plant press. Specimens collected and preserved during this study are stored at the A.C. Moore Herbarium of the University of South Carolina.

Botanical surveys were performed by Dr. John Nelson. Dr. Nelson received his Ph. D. in Biological Sciences from Florida State University and has been on the faculty of the University of South Carolina

since 1990. He is also Curator of the University of South Carolina's A.C. Moore Herbarium, and a recognized authority on the distribution and abundance of rare plants in South Carolina. He is widely known for his research on the taxonomy and ecology of the mint family (Lamiaceae). Prior to joining the University of South Carolina, Dr. Nelson worked as a Botanist with the Non-Game & Heritage Trust Section of the South Carolina Department of Natural Resources.

5.2 Animals

The surveys for birds, mammals, reptiles, and amphibians were designed to provide information on the occurrence and potential for occurrence of listed species at the VCSNS site and along the transmission corridors. Biologists conducted the survey of the VCSNS site by systematic walkover within all natural habitats, such that each habitat type was thoroughly searched. Surveys conducted along the transmission corridors were focused on areas identified, through the examination of aerial photographs and topographic maps, as providing potential habitat for listed animal species.

During each survey, wildlife species were identified through actual observations, as well as from tracks, scat, and birdcalls. Notes regarding species observed, as well as pertinent data regarding habitat quality, weather conditions, time of day, etc., were recorded in a field notebook. No trapping or other collecting activities were conducted, except where slow-moving reptiles or amphibians were captured by hand and released after identification. Because many animal species are mobile and secretive, the absence of a species during a survey is not necessarily conclusive evidence that the species does not use the area in question. Therefore, the *potential* for use of the VCSNS site and transmission corridors by listed wildlife species was also evaluated, based on the quality of habitats observed.

Wildlife surveys were conducted by Mike Whitten. Mr. Whitten has more than 12 years of experience as a wildlife biologist and ecotoxicologist. He currently serves as a Wildlife Biologist in the Aiken, South Carolina, office of Tetra Tech NUS, conducting wildlife surveys, habitat evaluations, and ecological risk assessments for government, commercial, and utility clients. He has managed or personally conducted studies in the midwest (Michigan and Indiana), middle-Atlantic (Pennsylvania, Maryland, and Delaware) and southeast (Alabama, Florida, Georgia, and South Carolina) that assessed the impacts of electric generating plants (both proposed and operational), transmission lines, gas pipelines and other development projects on threatened and endangered wildlife species. He has also advised government and utility clients on the management and protection of southeastern threatened and endangered species, including bald eagles, gopher tortoises, and red-cockaded woodpeckers.

6.0 RESULTS

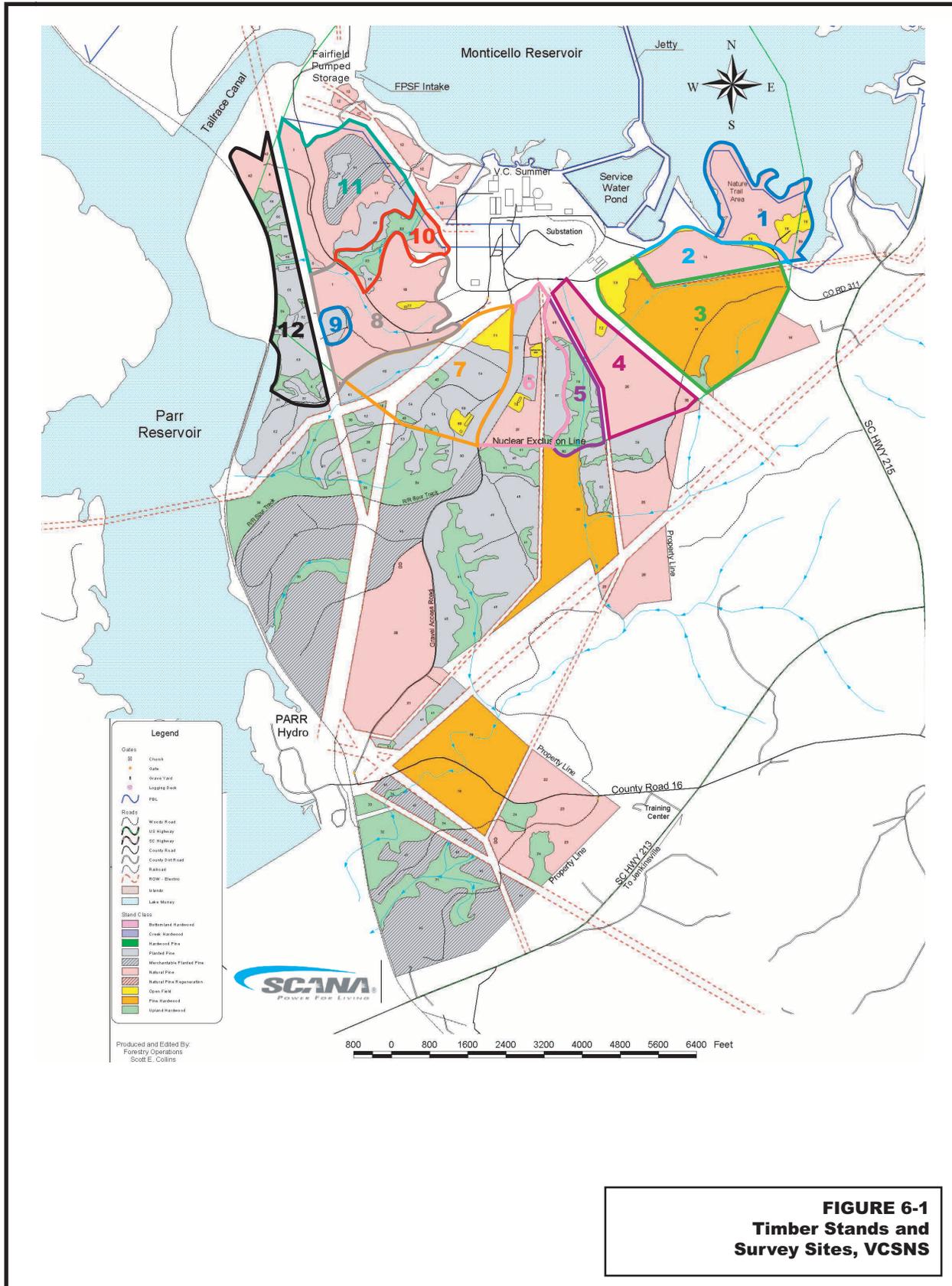
6.1 VCSNS Site

As noted earlier, in Chapter 2.0, the VCSNS site is approximately 2,245 acres in area, with about 860 acres covered by the southern portion of Monticello Reservoir. Approximately 1,385 acres are high ground, but 370 acres of this total are committed to generating facilities, support facilities, warehouses, landscaped areas, parking lots, and mowed grass (Photo 1, Appendix B). Another 125 acres of the VCSNS site are maintained as power line rights-of-way. The remaining area, approximately 890 acres, is forested.

The forests at VCSNS are characteristic of Piedmont forests, with a variety of canopy types. Most of the canopies are dominated by loblolly pine, either alone (heavily manipulated, merchantable pine) or in mixed pine/hardwood stands, generally “second growth” forest. These canopy types are generally low in diversity of vegetation. The most botanically-interesting forest systems on the VCSNS site contain a mixture of hardwoods with scattered pines, loblolly pine being ubiquitous in all forested ecosystems. These hardwood forests are best developed on steep slopes, and tend to be the most mature forest systems present. Canopy size and tree age at VCSNS appear to be related to slope aspect: steep slopes were generally less used for cotton farming or cattle grazing prior to the 1960s, when much of the land was acquired. However, no forest on the VCSNS site can be considered a virgin or near-virgin stand. An overview of habitats and vegetation is herein provided from east to west within the one-mile nuclear exclusion zone, the area that defines the VCSNS site. Figure 6-1, which is adapted from an SCE&G Forest Inventory Map (Collins 2001), shows these habitats, as well as locations within the VCSNS site surveyed in May 2002.

Both sides of the main entrance road (SC Hwy 311) feature second-growth pine woods. The portion on the north side of the road (Site 1), essentially bounded by the nature trail, is a monotonous near-even age stand of loblolly pine, featuring a thick layer of straw litter, and with little diversity. Hardwoods present include red maple, winged elm, along with black cherry and sweet-gum. The reader is directed to Appendix C for scientific names of these and other plant species mentioned in the report. Few herbaceous species are present, but include burning *Tragia*, spotted wintergreen, and broomstraw.

The forest on the south side of the entrance road (Site 2) is somewhat more diverse, with scattered stands of American beech and American holly. Persimmon, red cedar, black gum, and sourwood are present as well. Numerous open gullies and eroded ravines are present; and the herbaceous vegetation is not diverse.



M:\Util\Summer Station\T&E species\6-1 TE Timber Survey.ai

The adjacent forest (Site 3) is considerably more diverse, featuring mixed-mesophytic hardwoods on a variety of aspects. Two narrow creek drainages (north and south) harbor a variety of flowering herbs, including Hepatica, golden alexander, sanicle, Christmas fern, and little nut-rush. The canopy contains white oak, southern red oak, black gum, with flowering dogwood an important component of the understory. Portions of the forest include a substantial amount of beech.

Sites 3 and 4 are separated by the Summer-Pineland transmission corridor. Site 4 is similar to Sites 1 and 2, featuring a canopy of loblolly pine with a mixture of red maple and sweet-gum. Sites 4 and 5 are separated by the Summer-Denny Terrace transmission corridor.

Site 5 occurs along a narrow north-south creek drainage, a portion of Mayo Creek. This site is diverse and relatively interesting botanically, and features a steep east-facing rocky slope dominated by hardwoods with a mixture of pines. Several spring-blooming species are present here, including wild geranium, windflower, and Hepatica. The bottom along the creek is characteristic of well-developed Piedmont stream systems (an active beaver dam is present), featuring mayapple, as well as a fairly large population of painted buckeye and beech. The fairly uncommon sedge, *Carex superata*, present here in some abundance, is sometimes an indicator of high-quality Piedmont forests.

Site 6 includes a manipulated pine stand and exhibits little botanical diversity.

Site 7 consists mostly of planted pine, with little diversity.

Site 8, which features a considerable mixture of hardwoods and pines, is bisected by an access road. American beech, yellow poplar, sweet-gum, and hop hornbeam are common canopy and midstory elements here. The most interesting portion of this site is along a central flank, featuring a steep northeast-facing slope, its relief about 100 feet, overlooking a narrow creek drainage (the creek flows northwest). The slope itself is visually quite impressive, featuring large trees in the canopy. Beech, red maple, white oak, southern red oak, and sourwood occur in the canopy, along with hornbeam, Florida maple, and redbud in the subcanopy. The herbaceous layer is relatively rich, including woods iris, black cohosh, sicklepod, windflower, snakeroot, cinnamon vine, spotted wintergreen, fragrant sumac, wood grass, wild ginger, sanicle, and desmodium. In addition, boggy ground along the creek bed supports Vietnam grass and *Carex crinita*, a distinctive sedge.

Site 9 is a high-ground (approximately 400 foot elevation) pine forest shown on the SCE&G Forest Inventory Map (Collins 2001) as “pine plantation.” It merited attention because of its well-developed canopy and tall trees. The forest is clearly dominated by loblolly pine, with a reasonably diverse

subcanopy of white oak, American holly, hop hornbeam, American ash, flowering dogwood, southern red oak, nanny-berry, persimmon, sparkleberry, and winged elm. Muscadine is common. The herb layer features a variety of species, including tickseed, golden alexander, and licorice goldenrod.

Site 10 occurs immediately west of the powerblock area. SCE&G's Forest Inventory Map (Collins 2001) indicates that this area is "Upland Hardwood," but most of it is dominated by a wetland. The steep slopes on the south side of the creek feature white oak and mockernut hickory along with loblolly pine. Florida maple is scattered throughout the area. Of some interest is a population of wild savory, the only one seen during the study. The wetland occurs along a narrow drainage flowing to the west-southwest. A large portion of this stream has been dammed by beavers. The beaver pond area is quite diverse, featuring smartweed, climbing hemp, sensitive fern, black willow, cattails, monkeyflower, swamp skullcap, bishop's weed, false nettle, and rushes. An old dam with a culvert is present downstream from the dam. Here the canopy is more closed, and the bottomland forest present is relatively shady.

Site 11, immediately south of the FPSF, features mostly pine plantation and regenerating secondary woods with little diversity. A lawn on the east side of the powerline at this site features a population of *Hedeoma hispida*, a member of the mint family, which has been found in South Carolina prior to this survey in only two other locations. An attractive mesophytic woodland occurs in the northwest portion of Site 11, and features steep woods with Indian cherry, bell-wort, Christmas fern, Walter's violet, blue skullcap, yellow maypop and bee-mint, below a varied canopy of white oak, beech, hickory, and loblolly pine. Additionally, a north-facing bluff and woodland occur in this area adjacent to Weir 14. The canopy here contains white oak, black oak, and American beech, with pawpaw, witch hazel, and granddaddy greybeard below. Herbs present include sedges, black cohosh, Hepatica, snakeroot, and Christmas fern.

Sites 11 and 12 are separated by a transmission line that extends north from Parr Hydro. This transmission line was in service before VCSNS was built and does not connect to the VCSNS switchyard.

Site 12 is a north-south trending stretch of ground along the east side of the Parr Reservoir. Numerous hardwood "stringers" occur alternately with regenerating pine.

Transmission corridors inside the boundary of the VCSNS site were also inventoried. These rights-of-way feature a wide variety of topographic aspects and relief. All are heavily manipulated, and contain less woody vegetation than the off-site rights-of-way surveyed. Some of the rights-of-way are heavily gullied in places (Photo 2), with erosion revealing extensive areas of bare red clay. However, grassy slopes are often present as well, containing a surprising diversity of herbs. These include oat-grass, fescue, and sneezeweed, three ubiquitous components of the flora of the VCSNS rights-of-ways. Mall

grass, fleabane, wing stem, sticky catchfly, venus' looking glass, nut-rushes, pussy toes, wild carrot, wild radish, Johnson grass, plantain, cheat, and cutleaf primrose are common and regularly encountered. Blackberries commonly occur on these rights-of-ways, frequently in dense patches. Woody plants within transmission corridors are generally representative of the surrounding forest. Commonly observed woody species include nanny berry, sweet-gum, Russian olive, winged sumac, and hackberry, most frequently at the edges of the rights-of-ways.

6.2 Transmission Line Corridors

Before fieldwork began, the transmission corridors were evaluated using USGS topographic maps, aerial photographs, soil maps, and other resources. Lengths of corridor that appeared have potential for supporting a high level of biological diversity or harboring one or more rare species were identified and assigned unique survey location numbers (Figure 6-2). Each of these survey locations is described in the section that follows.

SUMMER-BLYTHEWOOD

B1

Location and access: West of Sec Hwy 422; Little Horse Branch, 2.4 miles southwest of US 321. Richland County.

Surrounding Land Use: Secondary forest, pine plantation.

Transmission line aspect: Dissected/gullied, with very large amount of tall shrubbery; this site has not been cleared for several years. Considerable standing dead woody vegetation is present from the last herbicide treatment. Much of the sprouting woody vegetation is attaining small tree stature presently, including white oak, post oak, persimmon, black gum, and red cedar. Large patches of turkey foot grass are also present.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

B2

Location and access: 2500 feet due west of US 321 along Will Douglass Road, about 4000 feet southwest of Blythewood Substation. Richland County.

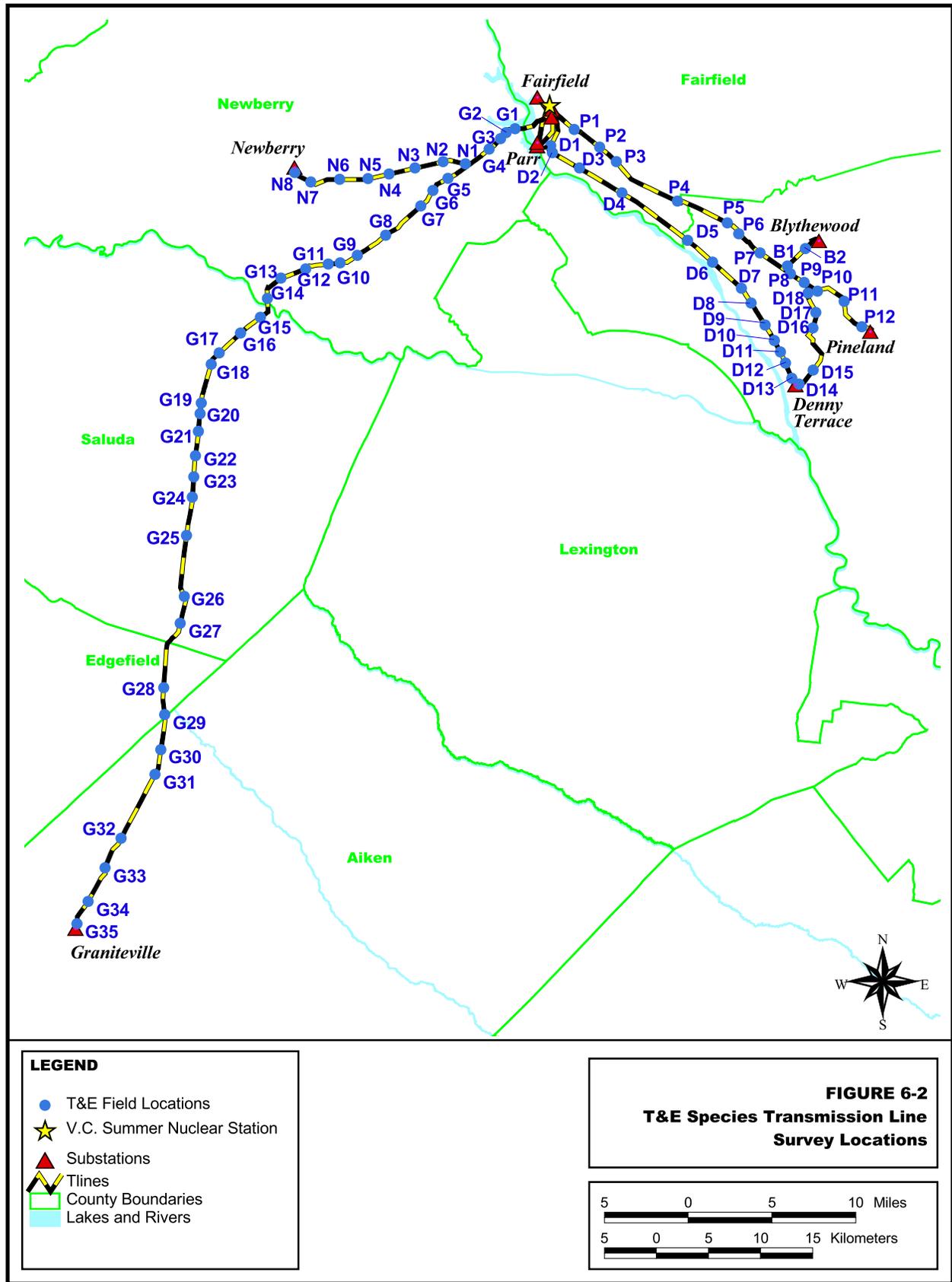
Surrounding Land Use: Secondary forest, pine plantation, housing.

Transmission line aspect: Much as above (B1). Variably dissected and gullied with considerable amounts of dead and living woody vegetation.

Additional observations: A new housing development is being constructed on the north and west sides of this site. A wetland zone is present on the south, featuring a number of grasses and sedges, just south of the transmission line.

Potential elements of occurrence: None.

Significant elements of occurrence: None.



SUMMER-DENNY TERRACE

D1

Location and access: 4000 feet east of Parr Substation on both sides of Sec. Hwy 16. Fairfield County.

Surrounding Land Use: Dissected hill/swales. Both sides of the transmission line are in forest. To the north side of Sec. Hwy 16, this forest is diverse, featuring shortleaf pine, loblolly pine, red cedar, and with American beech, white oak, blackjack oak, Florida maple, and red maple. Sparkleberry is a common shrub. The canopy tends to be relatively dense, and there is considerable pine straw litter on the floor.

Transmission line aspect: Mowed/cleared with practically no shrubs. A number of gullies are present, these exhibiting bare soil. Commonly observed herbs include pussy-toes, sunflower, black-eyed susan, burning Tragia, and licorice goldenrod.

Additional observations: The northern terminus of this site contains a wildlife food plot (corn). A steep north-facing slope occurs on the south side of Sec. Hwy 16; the upper portion (and summit) are largely scraped over, and highly disturbed, featuring abundant weeds (including field Croton). The north side of the highway is near a local population of American columbo, but the corridor itself contains no habitat for it. The forest on the immediate south side of the highway contains an impressive stand of American beech and mixed hardwoods.

Potential elements of occurrence: American columbo is known with certainty from the adjacent drainage of Mayo Creek.

Significant elements of occurrence: None.

D2

Location and access: 6000 feet southeast of Parr Substation on both sides of SC 213. Fairfield County.

Surrounding Land Use: Gently rolling topography. Both sides of the transmission line are in forest. To the north side of SC 213, this forest is fairly diverse, especially toward a narrow draw. Winged elm, American beautyberry, red maple, chestnut oak, water oak, and white oak are abundant. A reasonably large population of Cucumber tree occurs in one place along the east side of the corridor, the only site for this species within the study.

Transmission line aspect: Mowed/cleared with practically no shrubs. To the north of SC 213, a small boulder field is present, these mostly buried, and occurring as small outcrops. Commonly observed herbs include very abundant oat-grass.

Additional observations: A portion of this site contains a well-defined wildlife food plot (oats/rye).

Potential elements of occurrence: Pool sprite would be expected on granitic outcrops; the outcrops present here are not flat enough to support the development of vernal pools.

Significant elements of occurrence: None.

D3

Location and access: 7500 feet south of SC 215 along Pinner Road (unnumbered); about 1 mile south of Jenkinsville. Fairfield County.

Surrounding Land Use: Forestland, a canopy of loblolly pine and mixed hardwoods. The canopy is generally thin, especially on ridges. Portions of this forest appear to be managed loblolly pine, with very little diversity.

Transmission line aspect: Mowed/cleared throughout most of its length, with considerable lengths in blackberry as well as remnant shrub stands (dead or dying, having been treated with herbicide). Steep aspects are afforded by gullies near Pinner Road. Commonly observed herbs include very abundant oat-grass, pink Sabatia, burning Tragia, and considerable nut-rush. The dry woods margin provides habitat for narrow-leaf milkweed, a reasonably uncommon species.

Additional observations: A dirt road traverses a portion of this site. Recent off-road vehicle activity is obvious. A well-defined wildlife food plot is present. A large patch of Himalaya-berry was seen here, the only location of this introduced bramble during this study.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D4

Location and access: 5000 feet south of SC 215 along Wallaceville Road (= Sec. Hwy 232); 3 miles southeast of Jenkinsville. Fairfield County.

Surrounding Land Use: Forestland, a canopy of loblolly pine and mixed hardwoods. The canopy is thin, appearing somewhat "battered." A large portion of the land on the south side of the corridor, east of Wallaceville Road, has been clearcut.

Transmission line aspect: Mowed/cleared throughout most of its length, with scattered patches of dead/dying shrubs, as well as extensive blackberry thickets. The topography is mostly flat, although gullies are present toward the southeast and northwest. Of some interest is a fairly large draw/swale near the drainage of Freshley Branch, with an abundance of aquatic plants (cattails, scirpus, etc.). Commonly observed herbs include very abundant oat-grass, field onion, sand thistle (Photo 3), and nut-rush.

Additional observations: Climbing milkweed, rattlebox, and Rhynchosia occur on the west side of Wallaceville Road.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D5

Location and access: Along both sides of Little River, approximately 5500 feet downstream from SC 215 (Ashley Bridge), about 6 miles southeast of Jenkinsville. Access is provided by Littleton Road (unnumbered) from SC 215. The border between Fairfield and Richland Counties is Little River (Photo 4).

Surrounding Land Use: Forestland, a canopy of loblolly pine and mixed hardwoods. The south side of Little River exhibits a typical Piedmont floodplain forest, with associated steep north-facing slopes, especially downstream from the transmission line. Florida maple, ash, granddaddy greybeard and box elder are common along the transmission line within this flood plain.

Transmission line aspect: Mowed/cleared throughout its length, with the lawn presenting a disked look. Two deer stands present.

Additional observations: The Fairfield County side of this site is not readily accessible, being gated and locked. The forest here is essentially the same as the Richland County portion.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D6

Location and access: Approximately 2 miles southwest of SC 215 on the loop formed by Sec. Hwy 41. The "loop" is in the vicinity of the old town of Bookman (and Bookman Shoals). Richland County.

Surrounding Land Use: Cut-over forestland, a canopy of loblolly pine and mixed hardwoods.

Transmission line aspect: Brushy and/or grassy for its entire length. The site is mostly high ground, in part severely eroded, with two narrow swales present. Oat-grass dominates the herbaceous cover here.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D7

Location and access: Approximately 8000 feet southwest of SC 215, immediately north of Nipper Creek, on both sides of Sec. Hwy 38 (road to old town of Montgomery). Richland County.

Surrounding Land Use: Cut-over forestland, a canopy of loblolly pine and mixed hardwoods.

Transmission line aspect: Both sides of Sec. Hwy 38 at the transmission line are gated and locked: the corridor is dominated by a grassy lawn with considerable dead brush present.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D8

Location and access: Along both sides of Sec. Hwy 2374 (leading to Richland County Construction and Demolition Landfill on west side of transmission line), about 5000 feet southwest of SC 215; south side of Nipper Creek. Richland County.

Surrounding Land Use: Cut-over pine woods, with a mixture of hardwoods. Portions on the west side of the corridor are clearcut. The north side of Sec. Hwy 2374 exhibits steep north-facing bluffs, dominated by hardwoods.

Transmission line aspect: Mowed and open for its entire length. The topography on the south side of the access road is gently rolling to flat, and features a wetland (cut-over and brushy). Herbs present include thin-leaved mountain mint (Photo 5) in some abundance. Otherwise, the corridor is dominated by blackberries, fescue, and oat-grass.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D9

Location and access: SC 215 where crossed by the transmission line, in vicinity of Slatestone Creek. Richland County.

Surrounding Land Use: Manipulated pine woods, housing, urbanized.

Transmission line aspect: Mowed and open, with an intensive manicured look.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D10

Location and access: Along east edge of SC 215 at junction with Sec. Hwy 1281, immediately north of Burgess Creek; 7500 feet north of Columbia International University. Richland County.

Surrounding Land Use: Housing, urbanized.

Transmission line aspect: Mowed and open, in part fenced with horses.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D11

Location and access: Burgess Creek and Brice Hill, immediately north of Columbia International University; SC 215 crosses the corridor obliquely here. Richland County.

Surrounding Land Use: Mostly in secondary forest, otherwise highway corridor, urbanized.

Surrounding forests on both sides of the corridor at this point are fairly well-developed, with a heterogeneous canopy of hardwoods, including American beech, southern red oak, white oak, blackjack oak, and redbud.

Transmission line aspect: Grassy and open. The south portion of this site is on high ground, a steep north-facing slope of Brice Hill. The ground is in part eroded, and very rocky. Herbs present include chalky sunflower, tickseed, burning Tragia, joe-pye weed, windflower, and groundcherry. On the north side of SC 215, the corridor is flat and open, in part of the flood plain of Burgess Creek. The corridor here is very brushy, with blackberries in great abundance.

Additional observations: This is one of the more diverse sites of the Denny Terrace transmission line. Additional species present are phlox and climbing milkweed (Photo 6). Frost Mill Road (=Sec. Hwy 1785) provides access to the southern portion of this site, but access to the transmission line is prohibited.

Potential elements of occurrence: *Echinacea laevigata*.

Significant elements of occurrence: None.

D12

Location and access: South side of Columbia International University, 1800 feet southwest of SC 215. Richland County.

Surrounding Land Use: Pine woods; urbanized.

Transmission line aspect: A steep south-facing hillside, affording a good view of Columbia (Photo 7), occurs here. The corridor is heavily manipulated, featuring elderberry and considerable dead brush and an abundance of dead and living blackberries. Nevertheless, this corridor is remarkably diverse, especially on its edges and at the base of the hill, where a narrow stream flows. Oat-grass dominates the high ground, giving way in part to phlox, queen's delight, Euphorbia, wild rye, violet, cinnamon vine, and meadow-beauty (both pink and white forms), swamp day-flower, duck-potato, white-topped aster, cow-itch vine (Photo 8), and various sedges (*Cyperus* and *Rhynchospora*).

Additional observations: The north side of this site (north of the entry road) is mowed and brushy, of low diversity and little interest.

Potential elements of occurrence: *Echinacea laevigata*.

Significant elements of occurrence: None.

D13

Location and access: West side of Denny Terrace neighborhood, from Frost Avenue south to the substation. Richland County.

Surrounding Land Use: Housing, urbanized.

Transmission line aspect: Dissected and gullied, with significant erosion in places. The south side of Frost Avenue presents a mowed corridor with a steep south-facing aspect, featuring considerable herbaceous diversity (tickseed, oat-grass, man-root morning glory (Photo 9), field onion, frostflower, etc.). Portions of the corridor to the south maintain narrow, flowing wetlands, featuring boggy ground and seepage from the adjacent woods.

Additional observations: South of Denny Road, cultivated gardens occur on the corridor

Potential elements of occurrence: *Echinacea laevigata*.

Significant elements of occurrence: None.

D14

Location and access: Denny Terrace Substation, east to SC 215. Richland County.

Surrounding Land Use: Housing, urbanized.

Transmission line aspect: Flat, featuring the channel and floodplain of Crane Creek (Photo 10). The wetlands here are fairly extensive, featuring bishop's weed (Photo 11), duck-potato, various sedges (*Carex* and *Rhynchospora*), and lizard's tail.

Additional observations: This portion of Crane Creek is apparently ecologically sound, although under considerable threat from runoff from nearby streets and factories. This site, if managed properly, would make an outstanding urban wetland for community involvement. It would provide habitat for a number of wildlife species, especially birds.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D15

Location and access: Industrial park on east side of SC 215, north side of I-20. Richland County.

Surrounding Land Use: Secondary forest, urbanized.

Transmission line aspect: Flat, featuring the channel and floodplain of Crane Creek. Site is very weedy, otherwise dominated by a brushy lawn.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D16

Location and access: Both sides of Sec. Hwy 423, about 1-mile northwest of its junction with US 321. Richland County.

Surrounding Land Use: Secondary forest.

Transmission line aspect: Mostly flat and open, variably grassy and brushy.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D17

Location and access: Both sides of Sec. Hwy 947, about 4000 feet west of junction with US 321. Richland County.

Surrounding Land Use: Pine plantation, secondary forest.

Transmission line aspect: Gently sloping, with a south aspect; grassy and weedy.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

D18

Location and access: Terminus of unnumbered road and about 3000 feet south of Campground Road (= Sec. Hwy 38), 3000 feet west of US 321. Richland County.

Surrounding Land Use: Pine plantation, secondary forest.

Transmission line aspect: Brushy, mowed; mostly southwestern slope.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

SUMMER-GRANITEVILLE**G1**

Location and access: East side of Sec. Hwy 28, on west side of Parr Reservoir. Newberry County (Photo 12).

Surrounding Land Use: Pine plantation.

Transmission line aspect: Heavily disturbed, featuring logging roads; many patches of dead woody shrubs are present, and many weeds, including blackberries, Russian olive, *Wahlenbergia*, Indian chickweed, fescue, highway lespedeza, sneezeweed, thistle, yard plantain, purple vervain, wing-stem, venus' looking glass, and hairy brome.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G2

Location and access: West side of Sec. Hwy 28, immediately north of St. Pauls Church, 5000 feet west of Parr Reservoir. Newberry County.

Surrounding Land Use: Pine plantation, housing.

Transmission line aspect: Weedy, grassy ground, featuring abundant blackberries, cudweed, sneezeweed (Photo 13), and hairy brome. The east side of this site is bounded by clear-cut forest.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G3

Location and access: Between Sec. Hwy 33 and railroad near Hope Station, 4000 feet southwest of Sec. Hwy 28. Newberry County.

Surrounding Land Use: Pine plantation.

Transmission line aspect: Very brushy/grassy, featuring a gentle slope with a narrow central swale. Many weeds are present, including rabbit tobacco, thistle, oat-grass, fescue, and purple heliotrope.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G4

Location and access: East side of US 176, 2.4 miles southeast of Pomaria. Newberry County.

Surrounding Land Use: Pine plantation.

Transmission line aspect: Very brushy, alternately with weedy, grassy stretches; reasonably low herbaceous diversity. Herbs present include wingstem, cudweed, dogbane, poison hemlock, cattails, wild carrot, hairgrass, and orange milkweed (Photo 14).

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G5

Location and access: Between Meadowbrook Road (frontage road on east side of I-26), immediately west of exit 85, and SC 202, 3 miles south-southwest of Pomaria. Newberry County.

Surrounding Land Use: Pine plantation, housing, urbanized.

Transmission line aspect: Heavily disturbed, featuring gardens and planted lawns. Grasses dominate this weedy corridor, including fescue, Vulpia, hair-grass, along with field onion, cudweed, sneezeweed, and blackberries. One small swale (a tributary of Crims Creek) features a number of wetland plants.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G6

Location and access: Southwest side of I-26 along Dr. Bowers Road (unnumbered), immediately southeast of Kibler. Newberry County.

Surrounding Land Use: Pine plantation, housing.

Transmission line aspect: Heavily disturbed, featuring planted/manipulated lawns, and a large corn patch.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G7

Location and access: Berley Doland Road (unnumbered), 2 miles west of Little Mountain. Newberry County.

Surrounding Land Use: Pine plantation, housing.

Transmission line aspect: Dissected corridor features very brushy vegetation with little diversity.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G8

Location and access: Between Dreher State Park Road (= Sec. Hwy 26) and Camping Creek, about 1.5 miles southeast of Prosperity. Newberry County.

Surrounding Land Use: Pine plantation.

Transmission line aspect: Heterogeneous, brushy corridor featuring typical herbaceous flora.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G9

Location and access: Between SC 391 and Sec. Hwy 319, 1.5 south of Prosperity. Newberry County.

Surrounding Land Use: Pine plantation, agriculture, housing.

Transmission line aspect: Highly dissected ground featuring two ridges and three swales; most of the transmission line corridor is dominated by brushy vegetation, other parts of it are apparently pastureland.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G10

Location and access: West side of SC 391, along south side of Mother Goose Road (unnumbered road); two miles south of Prosperity. Newberry County.

Surrounding Land Use: Pine plantation, agriculture, housing.

Transmission line aspect: Most of this site is devoted to goats and cattle (Photo 15).

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G11

Location and access: Both sides of Sec. Hwy 231, 2 miles south-southeast of Prosperity. Newberry County.

Surrounding Land Use: Pine plantation, agriculture.

Transmission line aspect: The west side of this site is heavily brushy, with dead and living shrubby vegetation. The eastern portion is essentially a lawn of grasses, probably for livestock.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G12

Location and access: Between Sec. Hwys 360 and 407; south side of Stoney Hill, 4.8 miles southwest of Prosperity. Newberry County.

Surrounding Land Use: Pine plantation, agriculture.

Transmission line aspect: This is a heavily manipulated site on dissected topography. Most of the corridor is in pastureland, although considerable portions of it are brushy.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G13

Location and access: Between Sec. Hwys 541 and 237, 6 miles southwest of Prosperity. Newberry County.

Surrounding Land Use: Pine plantation, agriculture.

Transmission line aspect: This is a dissected site with most of the length of the transmission line in heavy brush. The ground is rocky, and there is considerable gullying. The eastern portion of the corridor is dominated by a pasture.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G14

Location and access: Near terminus of Sec. Hwy 774, at which point this is a private road; old Kempsons Bridge Road, 8 miles southwest of Prosperity. Newberry County.

Surrounding Land Use: Pine plantation, pasture.

Transmission line aspect: The transmission corridor is dominated by a low lawn, part of an extensive pasture.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G15

Location and access: Southwest edge of Lake Murray, 8.4 miles southwest of Prosperity. Saluda County.

Surrounding Land Use: Pine plantation.

Transmission line aspect: The transmission line traverses high ground bounded on both sides by reasonably dense pine forests; this site is of very little likelihood for significant species.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G16

Location and access: Both sides of SC 194, 10 miles northeast of Saluda. Saluda County.

Surrounding Land Use: Pine plantation, agriculture, pasture.

Transmission line aspect: The corridor is alternately dominated by heavy brush and mowed pasture ground.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G17

Location and access: Both sides of Sec. Hwy 44, about 8 miles northeast of Saluda. Saluda County.

Surrounding Land Use: Agriculture, pasture.

Transmission line aspect: The corridor is dominated by a planted garden and a mowed lawn.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G18

Location and access: Both sides of Sec. Hwy 121 on north side of Big Creek, about 6.3 miles northeast of Saluda. Saluda County.

Surrounding Land Use: Agriculture, pasture.

Transmission line aspect: The transmission line corridor on the north side of Sec. Hwy 121 is dominated by a hayfield. On the south side, most of the corridor consists of high ground sloping gradually toward the floodplain of Big Creek. The corridor is very brushy with woody as well as herbaceous plants, and has not been mowed recently.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G19

Location and access: Both sides of Sec. Hwy 164, just south of Little Saluda River, about 5 miles northeast of Saluda. Saluda County.

Surrounding Land Use: Agriculture, pasture.

Transmission line aspect: The corridor at this site is represented by a hayfield/mowed lawn/pasture.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G20

Location and access: South side of US 378, about 4 miles east-northeast of Saluda. Saluda County.

Surrounding Land Use: Agriculture, pasture.

Transmission line aspect: The corridor at this site is represented almost completely by a mowed lawn/pasture.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G21

Location and access: Sec. Hwy 21, 6000 feet south of US 378, about 4 miles east-northeast of Saluda. Saluda County.

Surrounding Land Use: Agriculture, pasture.

Transmission line aspect: The corridor at this site is represented almost completely by an active pasture.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G22

Location and access: US 178, 4 miles east of Saluda. Saluda County.

Surrounding Land Use: Agriculture, pasture.

Transmission line aspect: The corridor at this site is represented almost completely by an active pasture.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G23

Location and access: Sec. Hwy 432 between Poplar Branch and Corley Creek, 4 miles east of Saluda. Saluda County.

Surrounding Land Use: Pine plantation, agriculture.

Transmission line aspect: Very dense brushy vegetation, otherwise weedy; with low potential for significant species. A well-developed wildlife food plot (bean/buckwheat patch) lies on north side of Sec. Hwy 432, along with deer hunters' stands.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G24

Location and access: Sec. Hwy 29 at Richland, about 4 miles east-southeast of Saluda. Saluda County.

Surrounding Land Use: Agriculture, livestock grazing.

Transmission line aspect: Very low potential for significant species; heavily manipulated with livestock within the corridor, second growth pine plantations.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G25

Location and access: North side of Good Hope School Road (= Sec. Hwy 548) and north to Artem Road (= Sec. Hwy 340), about 5.2 miles southwest of Saluda. Saluda County.

Surrounding Land Use: Agriculture, livestock, pastureland.

Transmission line aspect: Very low potential for significant species; heavily manipulated with livestock within the corridor, second growth pine plantations.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G26

Location and access: North side of Murphy Farm Road (unnumbered) and north to Neighbors Road (= Sec. Hwy 149), 1.5 miles northwest of Ridge Spring. Saluda County.

Surrounding Land Use: Agriculture (especially peach orchards), pine plantation.

Transmission line aspect: Very low potential for significant species; flat topography at a bend in the transmission line. Abundant grasses, goldenrod, and fetid *Pluchea* occur at a small depression within the corridor North of this site, the corridor is used for pasture.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G27

Location and access: Junction of SC 23 and Sec. Hwy 238, west side of Ridge Spring. Saluda County.

Surrounding Land Use: Agriculture, forest remnant.

Transmission line aspect: This site was examined due to its near proximity to known locations for *Harperella*, high-pond *Hypericum*, spoon-leaf seedbox, and rosy tickseed. However, no habitat is present along the transmission line for any of these wetland species.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G28

Location and access: South side of McCreight Road (= Sec. Hwy 17), about 5 miles southeast of Johnston. Edgefield County.

Surrounding Land Use: Pine plantation.

Transmission line aspect: The site on the north side of Sec. Hwy 17 is largely unimpressive. The south side however, is particularly interesting in its association with the south fork of the Edisto River and the flood plain of Beeck Creek, a tributary of the Edisto.

Additional observations: Reasonably intact forestland occurs on the upper portion of the site (at least on the west side), and a gently sloping flat stretches here toward the south. The corridor is relatively diverse, featuring numerous grasses and sedges, sunflowers, ironweed, and *Angelica*. Of highest interest here is the presence of bog-mint (*Macbridea caroliniana*), which was not expected at this site (Photo 16). This is essentially a Coastal Plain species, and its presence here indicates some affinity with the soils of this area and the outer Coastal Plain.

Potential elements of occurrence: None.

Significant elements of occurrence: Bog-mint, *Macbridea caroliniana*, GPS reading as 34°17.584, 81°18.355. This plant is a Federal species of concern. It has recently been the subject of a status review study.

G29

Location and access: North side of Sec. Hwy 270, up to South Fork of Edisto River. Aiken and Edgefield Counties.

Surrounding Land Use: Pine plantation.

Transmission line aspect: This site consists of about half high/dry ground (on the south portion), which also features a couple of reasonably well-developed sandhill bogs in swales, and a gently sloping hillside toward the South Fork of the Edisto River.

Additional observations: The surrounding forests on the Aiken County side are fairly heavily manipulated, with an even crown and little diversity. The sandhill bogs are considerably more interesting, and substantial inventory time was spent here. Orange milkwort, beakrush, shining panic grass, dwarf

meadow beauty, pink meadow beauty (Photo 17), and abundant mats of *Sphagnum* moss were observed. This sort of bog is highly reminiscent of Coastal Plain ecosystems, and suggests agreement with soils as mapped in this area ("The Ridge") as being related more to those of the Coastal Plain than either the Piedmont or fall-line sandhills.

Potential elements of occurrence: sandbog beakrush, narrow-leaf beakrush, rough-leafed loosestrife.

Significant elements of occurrence: None.

G30

Location and access: Sec. Hwy 208, 3 miles northeast of Eureka. Aiken County.

Surrounding Land Use: Pine plantation, agriculture, housing, pasture.

Transmission line aspect: Heavily manipulated, featuring a junkyard and variously scraped sand.

This is high and dry ground that supports abundant prickly pear cactus, sandhill morning-glory, and false indigo.

Additional observations: The area would seem to be suitable for *Stylisma pickeringii*.

Potential elements of occurrence: *Stylisma pickeringii*.

Significant elements of occurrence: None.

G31

Location and access: Mason Branch Road (unnumbered) at Sec. Hwy 155 (both sides); 2 miles northeast of Eureka. Aiken County.

Surrounding Land Use: Pine plantation, agriculture, pastureland.

Transmission line aspect: Heavily manipulated, disturbed, and weedy (ragweed, fleabane, rosin-plant, *Wahlenbergia*, sand spur, poke salad, etc.)

Additional observations: Of little interest botanically, other than some jointweed that occurs on the north side of Sec. Hwy 155 on high/dry ground.

Potential elements of occurrence: *Stylisma pickeringii*.

Significant elements of occurrence: None.

G32

Location and access: SC 19SC 191 near I-20, north side of Vaucluse. Aiken County.

Surrounding Land Use: Pine plantation, agriculture, pasture.

Transmission line aspect: Pastureland in part. Highly manipulated by surrounding land use.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G33

Location and access: SC 191 near I-20, north side of Vaucluse.

Surrounding Land Use: Pine plantation, agriculture, pasture.

Transmission line aspect: Mowed in considerable part, and much of it now pasture ground. The corridor tends to be weedy, and of little interest botanically due to heavy manipulation, especially on the north side of I-20. On the south side of the interstate, a steep south-facing slope complex (not associated with the transmission line) may provide habitat for significant plants; this site is on private land, inaccessible during the study. Several gullies present.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G34

Location and access: Between Sec. Hwys 105 and 503, east side of Vacluse.

Surrounding Land Use: Pine plantation, housing.

Transmission line aspect: Variably grassy/brushy with abundant patches of dead woody vegetation. Open gullies present.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

G35

Location and access: Graniteville Substation and approximately 4000 feet north, east side of SC 191.

Surrounding Land Use: Longleaf pine forest, a portion of which (southeast) has been clearcut.

Transmission line aspect: Gently ascending slope toward north.

Additional observations: Both sides of the transmission line corridor border longleaf pine forest. This is probably the most arresting site, visually, that was surveyed. The corridor is dominated by herbs, with very little woody vegetation above low shrub level. Few weeds are present, and the vegetation is largely characteristic of healthy, xeric to near-xeric sandhills of central South Carolina. The corridor supports a large population of the sandhill endemic “jointweed” (Photo 18). Additional species include maypop, sandhill thistle, Lloyd’s hypericum (Photo 19), sandhill morning-glory (Photo 20), prickly pear cactus, yellow Baptisia, devils’ shoestring, silky-scale, sticky foxglove (Photo 21), narrowleaf ironweed (Photo 22), sensitive briar, and tread-softly (Photo 23). Deep sands dominate the site.

The surrounding forests are without question the highest quality stands of longleaf seen during this study. Many of the trees on both sides of the line are of considerable size. Four woodpecker species (red-headed, downy, hairy, yellow shafted flicker) were observed in the forests adjacent to the corridor, but the habitat appears to be only marginally suitable for red-cockaded woodpeckers. The forest on the west side of the corridor appears to have been thinned recently; that on the east side has an obviously denser canopy. On the east side of the corridor, sandhill rosemary, an additional sandhill endemic, occurs in some abundance. The presence of any dripping or seeping wetlands in association with this site would be grounds for serious additional investigation. However, no such wetlands have been seen along the corridor

Potential elements of occurrence: *Stylisma pickeringii*, *Nolina georgiana*, *Sporobolus teretifolius*.

Significant elements of occurrence: None.

SUMMER-NEWBERRY**N1**

Location and access: South side of Sec. Hwy 202, 4000 feet southwest of junction with US 176. Newberry County.

Surrounding Land Use: Secondary forest, pasture, hay fields.

Transmission line aspect: Relatively flat and open, featuring a localized wet spot. The corridor is dominated by grasses and has apparently been recently mowed.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

N2

Location and access: Unnumbered road just north of Sec. Hwy 521 on west side of abandoned railroad line, about 2 miles southwest of Pomaria. Newberry County.

Surrounding Land Use: Clear-cut, secondary forest, housing, pasture. The east end of the site is bordered by an abandoned railroad line, present now only as a berm.

Transmission line aspect: Dissected landscape with several draws with active streams.

Additional observations: This is one of the most diverse sites visited during this project, in part because of the care taken to develop it as wildlife habitat (a sign to this effect exists on the east edge of the site). A wide variety of shrubs and herbs is present within the corridor, and considerable care was taken to inventory species present. typical Piedmont corridor vegetation includes oat-grass, blackberries, burning Tragia, thistle, heal-all, wild petunia, sun-drops, false dandelion (Photo 24), helenium (Photo 25), and fescue, and in the draws along streams, buttonbush and bear's paw (Photo 26), and various grasses and sedges. One of the largest populations of Indian pink (Photo 27) observed during this study was seen here. Three different species of milkweeds.

Potential elements of occurrence: *Echinacea laevigata*.

Significant elements of occurrence: None.

N3

Location and access: Exit 82 on I-26, where crossed by SC 773. Wicker Road (= Sec. Hwy 358) provides access to the central portion of the site. Newberry County.

Surrounding Land Use: Clear-cut, secondary forest, highway corridor, housing, pasture.

Transmission line aspect: This is a highly disturbed site. Portions of it are in gardens and pasture; the most "natural" portion is near I-26 in the vicinity of Mt. Hebron Church.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

N4

Location and access: Jollystreet Substation, along Old Jollystreet Road (= Sec. Hwy 99), about 3.2 miles northeast of Prosperity. Newberry County.

Surrounding Land Use: Forest, pastureland.

Transmission line aspect: Fairly steep slopes are associated with gullying; vegetation very dense and brushy, with considerable dead vegetation still standing.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

N5

Location and access: Along Sec. Hwy 436, just south of Kerr Creek, 2.4 miles northeast of Prosperity. Newberry County.

Surrounding Land Use: Forest, clearcut, pastureland, housing.

Transmission line aspect: Very brushy terrain offers difficult access and maneuvering. Little open ground present.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

N6

Location and access: Along Sec. Hwy 82, about 2 miles northwest of Prosperity. Newberry County.

Surrounding Land Use: Forest, pastureland, housing.

Transmission line aspect: Very brushy terrain.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

N7

Location and access: Along Sec. Hwy 281, about 2.5 miles northwest of Prosperity at Colony Church along US 176. Newberry County.

Surrounding Land Use: Forest, highway corridor, housing.

Transmission line aspect: Open terrain, mowed. Very little diversity. This site is fairly heavily disturbed due to its proximity to buildings and a major highway.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

N8

Location and access: Newberry Substation, and south and southeast for about 6000 feet.

Surrounding Land Use: Secondary pine/hardwoods, housing.

Transmission line aspect: Open terrain, mowed. The portion of the corridor immediately south of the substation is quite wide, due to the presence of additional transmission lines converging here.

Additional observations: The corridor itself gently slopes toward the southeast, ultimately crossed by a narrow swale that has been dammed by beavers (Photo 28). Aquatic plants are abundant. The corridor is relatively weedy, featuring, in addition to the ubiquitous oat-grass, burning Tragia, and field onion, considerable amounts of poison ivy, sprouting black cherry, highway lespedeza, rabbit's foot clover, winged sumac, horse nettle, purple vetch, cudweed, and sleepy catchfly.

Potential elements of occurrence: None. The area around the beaver pond is of some interest, however, no significant species are present.

Significant elements of occurrence: None.

SUMMER-PINELAND**P1**

Location and access: Both sides of SC 215 immediately north of Sec. Hwy 247; Jenkinsville. Fairfield County.

Surrounding Land Use: Mixed pine/hardwoods, pine plantation, housing.

Transmission line aspect: Variously dissected to level; features deep gullies on west side of SC 215. Terrain is rather rough, with dense patches of low shrubs and blackberries.

Additional observations: Considerable numbers of Indian cherry occur along the west part of this site. This is a reasonably common Piedmont species but one that is commonly overlooked unless in fruit.

Turkey foot grass, Carolina rose, blue skullcap (Photo 29).

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P2

Location and access: Both sides of Sleepy Hollow Road (= Sec. Hwy 514), just east of SC 215 on southeast side of Jenkinsville. Fairfield County.

Surrounding Land Use: Mixed pine/hardwoods, pine plantation.

Transmission line aspect: Variously dissected to level; grassy/brushy high-ground corridor

Additional observations: Turkey foot grass, Carolina rose, blue skullcap, sneezeweed.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P3

Location and access: East of SC 215 on south side of Sec. Hwy 60 at Rock Hill. Fairfield County.

Surrounding Land Use: Mixed pine/hardwoods, pine plantation, housing.

Transmission line aspect: Highly dissected, featuring difficult terrain: extremely brushy with dead woody plants as well as extensive groves of blackberry and dog fennel, etc. Some very deep, bare gullies occur. A house site occurs on the east side of the corridor, and signs of regular ATV use are present. A narrow creek bottom occurs nearby, and features typical corridor wetland species.

Additional observations: *Lespedeza cuneata* is especially abundant along the roadside, with fescue. A large patch of Himalaya berry occurs here as well.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P4

Location and access: Both sides of Brown's Bridge Road (= Sec. Hwy 420 extension), west side of Little River. Fairfield County.

Surrounding Land Use: Pine plantation, pastureland.

Transmission line aspect: Fairly flat ground. The ground is eroded, and red clay gullies are well-developed. From Sec. Hwy 420 toward Little River, the transmission line is devoted to a large cattle pasture. Northwest of the road, the corridor is very brushy.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P5

Location and access: Both sides of SC 269, about 5000 feet north of SC 215. Richland County.

Surrounding Land Use: Pine plantation, pastureland.

Transmission line aspect: Fairly flat ground, largely disturbed with a new housing development putting put in. The site is very brushy and not diverse.

Additional observations: Dry ground species include tickseed, big-leaf compass plant.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P6

Location and access: Both sides of Sec. Hwy 682 (at Cedar Creek Church) immediately east of junction of SC 215 and SC 269. Richland County.

Surrounding Land Use: Pine plantation, pastureland.

Transmission line aspect: Highly dissected and disturbed. A wood chipping operation occurs here; most of the corridor is very brushy and open.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P7

Location and access: Sec. Hwy 59, about 1 mile south of Oak Grove Church, 4 miles west of Lin Rick golf course. Richland County.

Surrounding Land Use: Pine plantation, pastureland.

Transmission line aspect: Dissected and gullied. Most of the site is dominated by grassy/brushy lawns; the east portion contains a junkyard within the corridor

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P8

Location and access: Junction of Friendly Wood (= Sec. Hwy 422) and Pineway (=Sec. Hwy 1436) Roads, 1.5 miles east of Lin Rick golf course. Richland County.

Surrounding Land Use: Pine plantation, housing, pastureland.

Transmission line aspect: Mostly flat. The northwest portion of this site has not been mowed for some time, and the herbaceous layer (mostly grasses) is quite dense. Included with the grasses are blackberries, maypop, verbena, fleabane, and horse nettle. Many dead woody shrubs are scattered throughout. The southeast portion, which is gated, has been recently mowed, and exhibits a low lawn.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

P9

Location and access: Both sides of Campground Road (=Sec. Hwy 38), 3000 feet west of US 321 and about 6 miles north-northwest of I-20. Richland County.

Surrounding Land Use: Pine plantation, housing, pastureland.

Transmission line aspect: Mostly flat. Site is dominated by a low lawn of various grasses, also prickly-pear cactus.

Potential elements of occurrence: *Stylisma pickeringii*.

Significant elements of occurrence: None.

P10

Location and access: West side of US 321 along south side of Faunus Road, 5.3 miles north of I-20. Richland County.

Surrounding Land Use: Pine plantation, housing, pastureland.

Transmission line aspect: Generally flat.

Additional observations: The only interesting part of this site is an open bog immediately west of US 321 which features many Coastal Plain species. This bog would otherwise resemble well-developed

sandhill seepages known from elsewhere in Richland County (most notably Fort Jackson) except for the fact that this corridor is apparently never burned. Conspicuous members of the bog include pink sundew, orange milkwort, sweetbay magnolia, and a number of sedges. Sphagnum moss is abundant and widespread, probably consisting of several species. The bog here potentially represents habitat for a number of rare species, but because it is not burned, it is very unlikely that these plants will occur here. Nevertheless, considerable effort was made to locate rare species, as this is an anomalous site relative to the rest of the study. A management program on a community level, involving limited on-site burning, would no doubt increase the diversity of this bog, and probably encourage additional species, currently not apparent, to bloom.

Potential elements of occurrence: Rough-leafed loosestrife, red treasure lily, sandbog beakrush, narrow-leaf beakrush.

Significant elements of occurrence: None.

P11

Location and access: North side of Sec. Hwy 61, 6000 feet east of US 321, 3.6 miles north of I-20. Richland County.

Surrounding Land Use: Floodplain forest, oak-hickory pine woods.

Transmission line aspect: Flat portion along floodplain of Dry Fork Creek on north side of Sec. Hwy 61. Farther to the north, the transmission line climbs steep, rocky ground, thus affording a southern exposure.

Additional observations: Most of the corridor is dominated by grasses and brush, in a very heterogeneous assemblage. The wetland portion contains numerous permanent “puddles,” these featuring wetland and aquatic species (especially sedges). In addition, a portion of the floodplain forest here has been cut-over. Moderate erosion and gulying takes place on the high ground portion of this site. This site is relatively diverse. Among the herbaceous plants seen are tickseed, white-topped aster, fescue, poison hemlock, and small-flowered milkwort.

Potential elements of occurrence: *Echinacea laevigata*.

Significant elements of occurrence: None.

P12

Location and access: 3500 feet west of US 21 along Alta Vista Road (unnumbered); also at US 21 and intervening distance; Pineland Substation. Richland County.

Surrounding Land Use: Second-growth pine woods, housing, urbanized

Transmission line aspect: Variable mowed and/or brushy, the topography is mostly gently sloping, including a portion of the Crane Creek flood plain. The corridor features pastures and active gardens.

Potential elements of occurrence: None.

Significant elements of occurrence: None.

7.0 DISCUSSION

The discussion that follows elaborates on possible reasons for the absence of the target species listed in Table 4-1, species that were thought to have some chance of occurring in the study area based on historical records and the habitats present.

7.1 Plants

Pool sprite (*Amphianthus pusillus*) is an extremely rare annual species in South Carolina. The largest and most consistently reappearing populations are in Lancaster County at Flat Creek Natural Area. This is a plant absolutely endemic to open flat granite rocks, with enough surface area to allow the development of shallow pools which fill with water during spring rainy periods, when the seeds germinate, followed by rapid growth, flowering, and fruit set. Transmission corridors featuring granitic rock anywhere within this project were examined for the slightest possibility of occurrence; the best developed “flatrocks” are just south of VCSNS (see Denny Terrace Site D2). Some boulders were seen elsewhere along powerlines in Fairfield County, but none was adequate for supporting this species. It is highly unlikely that Pool sprite ever occurred anywhere within the study area, and there is little likelihood of its ever appearing within it.

Smooth coneflower (*Echinacea laevigata*) is very rare in South Carolina. The best developed populations are on marble or similar rock in Oconee County. Aiken and Richland Counties have small populations that have been argued as non-natural. Additionally, some evidence suggests that smooth coneflower depends in part on occasional fires. Considering the absence of truly circumneutral soils on the transmission corridors studied, the absence of apparent habitat on neighboring land, and the fact that fires are practically non-existent in the transmission corridors, it is highly unlikely that smooth coneflower ever has been a resident of these areas. Nevertheless, it was sought on open corridors featuring steep, rocky terrain, throughout this project.

Rough-leafed loosestrife (*Lysimachia asperulaefolia*) is known from a highly specialized, fire-maintained sandhill ecosystem in Richland County (Fort Jackson). It is absolutely dependent on recurring fires, and is historically known only east of Columbia (i.e., Florence County). Some possibility exists that this species could survive on boggy places under powerlines studied in this survey, but there are only two sites (see Graniteville G29 and Pineland P10) that could reasonably be considered, and neither of them is burned. Portions of the Graniteville transmission corridor would be thought to potentially support loosestrife, but no sandhill seepage bogs were discovered. It is highly unlikely that rough-leafed loosestrife has ever grown anywhere within the project area.

Harperella (*Ptilimnium nodosum*) is a conspicuous (when flowering) herb that is known from a few “high ponds” in South Carolina. It is of potential occurrence, therefore, in suitable habitat along portions of the Summer-Graniteville line, particularly around Ridge Spring. High ponds occur around SC Hwy 23 in the vicinity of the Graniteville line, but these bays are highly altered, and little resident native vegetation remains. On the other hand, the Graniteville line does not appear to specifically cross any Carolina bays in the region. It is conceivable, nevertheless, that Harperella may have grown in wet places prior to the development of the Graniteville line, but it is rather certain that no suitable habitat exists for it now.

Relict trillium (*Trillium reliquum*) in South Carolina is known from Aiken and McCormick Counties, along tributaries of the Savannah River. The plants are apparently restricted to sites over mafic rock, within old-growth, intact forest systems. They do respond somewhat positively to disturbance, and may be expected to survive in opening under powerlines if present in adjacent forests. No trilliums were seen during this survey. The Aiken County locations for this species are much unlike anything else seen in Aiken County under the Graniteville transmission line; it is extremely unlikely that this species ever occurred in the project area.

Canby’s dropwort (*Oxypolis canbyi*) is a perennial member of the carrot family, which in South Carolina is nearly restricted to mostly canopy-free Carolina bays. The nearest populations to the powerlines studied are in lower Richland County. Suitable habitats are not present at all under the Denny Terrace and Pineville lines. It is conceivable that this plant could occur in the vicinity of the wetlands previously supporting Harperella (Aiken-Edgefield County), but that would involve a fairly significant range extension in South Carolina. It is unlikely that Canby’s dropwort ever grew in association with transmission corridors of this project.

Georgia aster (*Aster georgianus*) is a perennial member of the sunflower family, maintained by some taxonomists as a variant of the widespread *A. patens*. It is reasonably difficult to separate these taxa even with flowering material. Habitat preferences are not clear, although there is some suggestion that Georgia aster, as an entity, may be associated with smooth coneflower. Plants referable to *A. patens* were occasionally observed on the Graniteville and Denny Terrace transmission corridors.

Bog-mint (*Macbridea caroliniana*) occurs as one population on the Graniteville corridor (see Graniteville Site G28). This is a highly conspicuous (when in bloom) perennial member of the mint family, and it has recently been the object of a status review for possible consideration as a candidate for federal listing. Elsewhere in South Carolina this species is a resident generally of old-growth swamp ecosystems, a good example being a large colony along the boardwalk system at Congaree Swamp National Monument

(Richland County). The plants at Site G28 are on opposite sides of the corridor, and represented by only a few clumps on each side. Presumably, the adjacent forest on both sides is suitable habitat. It is not clear whether the population below the powerlines has been there indefinitely, or if it has recently been able to move into the corridor. The plants' location suggests the former. The plants seem to be secure; however, the site is manipulated for deer hunting (a stand located nearby overlooks the site) and the central portion of the corridor appears to be plowed at least occasionally.

The most important botanical element in the vicinity of VCSNS is American columbo (*Frasera caroliniensis*), which occurs on SCE&G land approximately one mile south of the site boundary. This plant occurs at one place along the west bank of Mayo Creek, and the population appears to be expanding. While not listed as an endangered species, this plant is very rare in South Carolina, and the Mayo Creek population is the state's largest. Although technically out of scope, because it occurs off-site and the species is not listed, this population seems worthy of mention.

7.2 Animals

The bald eagle (*Haliaeetus leucocephalus*) was the only listed animal species observed during the surveys. Four juvenile bald eagles were observed on May 30, 2002 perched in trees near the FPSF at the VCSNS site, and two adult eagles were seen just offsite, on the (north) bank of the FPSF tailrace canal. An adult and three juvenile bald eagles were seen later on the same day approximately one-half mile south of the railroad trestle that crosses the FPSF tailrace. Bald eagles are commonly observed foraging around Monticello Reservoir, the FPSF tailrace canal, Parr Reservoir, and on the Broad River downstream of Parr Shoals dam. There are no recorded eagle nests at the VCSNS site, but there are six nests within five miles of VCSNS, the nearest being approximately two miles from VCSNS (Holling 2001). Four of these six nests are believed to be active nesting sites, while the status of two nests is unknown (SCDNR 2002).

There are two recorded bald eagle nests in the vicinity of the Summer transmission lines. The nearest is an active nest in Saluda County, approximately 0.5 mile west of the Summer-Graniteville transmission line. One nest in Richland County is approximately 0.9 mile south of the Summer-Denny Terrace transmission line; the current status of the Richland County nest is unknown, but the nest was "viable" as recently as 1995 (SCDNR 2002).

Red-cockaded woodpeckers (*Picoides borealis*) are known to occur in Aiken, Edgefield, Richland, and Saluda counties. Active nest cavities of this cooperative breeder occur in open, mature pine stands with sparse midstory vegetation. When the hardwood midstory grows above 15 feet, cavity abandonment

usually occurs (Hooper et al. 1980). Preferred habitat for this species is not found at the VCSNS site, nor is it found along the transmission corridors. Site G35 on the Summer-Graniteville corridor was the only location where the Summer transmission corridors passed through mature, marginally open pine forests. At this location, however, numerous oaks of considerable height are scattered among the pines, significantly decreasing the probability that red-cockaded woodpeckers would occur here. Nevertheless, the forest adjacent to Site G35 was thoroughly searched, and no active or abandoned nest cavities were observed.

Wood storks (*Mycteria americana*) from the Birdsville Colony (near Millen, Georgia) forage in shallow wetlands on the Department of Energy's Savannah River Site and in specially constructed ponds on the National Audubon Society's Silver Bluff Sanctuary, near Jackson, South Carolina (DOE 1997; NAS undated). There are no known nesting colonies in Aiken County. No transmission corridors associated with VCSNS cross or approach the Savannah River Site or the Silver Bluff Sanctuary, and wood storks have not been recorded near VCSNS or the Summer transmission line corridors.

Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) has been recorded in Aiken and Richland counties (SCDNR 2002). This bat is found in forested areas, especially in pine flatwoods and pine-oak woodlands. It roosts in hollow trees, under bark, in old cabins and barns, and in wells and culverts, and its geographic range includes the entire southeastern United States (Brown 1997). Thus, Rafinesque's big-eared bat could occur in forested portions of the VCSNS site or in forested areas adjacent to the transmission corridors.

The gopher tortoise (*Gopherus polyphemus*) inhabits sandy, well-drained areas where adequate vegetation for foraging exists. Gopher tortoise burrows, which are readily visible, have not been observed at VCSNS. In addition, no burrows have been recorded in or adjacent to the transmission line corridors associated with VCSNS (SCDNR 2002). Gopher tortoises have not been recorded north of Aiken County (SCDNR 2002), and the Aiken Gopher Tortoise State Preserve is the northernmost extent of the species range. The Graniteville substation, which is the southern terminus of the Summer-Graniteville transmission corridor, is 18 miles west-northwest of the Aiken Gopher Tortoise State Preserve, and thus, is slightly north of the known species range. Gopher tortoises are generally not found in areas of Piedmont soils, which characterize most of the transmission corridors associated with VCSNS. Soil types suitable for this species exist only in the southern portion of the Summer-Graniteville corridor, corresponding roughly to Sites G28 through G35 of Figure 6-2. No tortoise burrows were observed at these or any other sites surveyed during the surveys of the Summer transmission lines. It is highly unlikely that gopher tortoises exist in the study area.

American alligator (*Alligator mississippiensis*) habitat consists of swamps, marshes, ponds, lakes, and slow-moving streams and rivers. Alligators are known to occur in Aiken and Richland counties and could occur in wetlands crossed by transmission corridors in these counties.

The spotted turtle (*Clemmys guttata*) inhabits shallow bodies of water such as swamps and small streams. It has been recorded in and around Carolina bays and bogs on the Savannah River Site in Aiken County (Gibbons and Semlitsch 1991). The spotted turtle could occur in suitable habitats crossed by the southern (Aiken County) portion of the Summer-Graniteville transmission corridor, but this is believed to be unlikely. The VCSNS site is near the northern extent of the geographic range of this species.

The pine barrens treefrog (*Hyla andersonii*) is known to occur in Richland County (SCDNR 2002). This species inhabits trees in swamps adjacent to sandhill habitats (Martoff et al, 1980). There are no recorded occurrences of this species in or adjacent to the transmission line corridors associated with VCSNS (SCDNR 2002). Due to the general absence of suitable habitat at VCSNS and along the transmission lines, it is unlikely that pine barrens treefrogs exist in the study area.

Webster's salamander (*Plethodon websteri*) has been recorded in Saluda and Edgefield counties (SCDNR 2002), which represent the eastern extent of its range. Webster's salamander inhabits moist, mixed hardwood forests on steep north-facing slopes with rock outcrops (Martoff et al. 1980). There are no recorded occurrences of this species in or adjacent to the transmission line corridors associated with VCSNS (SCDNR 2002). Because its geographic range is west of VCSNS and the lack of suitable habitat along the transmission lines, it is unlikely that Webster's salamanders exist in the study area.

The Carolina gopher frog (*Rana capito capito*) inhabits upland, xeric areas, especially longleaf pine/turkey oak sandhills. It takes shelter during the day in active and abandoned gopher tortoise burrows, crayfish burrows, and stump holes, but lays its eggs in seasonally flooded, grassy ponds and cypress ponds that lack fish populations. It has been recorded in and around Carolina bays on the Savannah River Site in Aiken County (Gibbons and Semlitsch 1991). The likelihood of this species occurring at VCSNS is low, due to lack of suitable habitat. Likewise, the probability of this species breeding within the transmission corridors is low, due to lack of appropriate breeding habitat. It is conceivable that Carolina gopher frogs could find shelter in some wetlands along the southern (Aiken County) portion of the Summer-Graniteville transmission corridor.

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APPENDIX A

Agency Consultations

From: Lori_Duncan@fws.gov [mailto:Lori_Duncan@fws.gov]
Sent: Thursday, March 15, 2001 12:45 PM
To: ssummer@scana.com
Cc: Steve_Gilbert@fws.gov; Jason_Ayers@fws.gov
Subject: Virgil C. Summer Nuclear Station License Renewal

Please find attached a Word Perfect document with the Federally listed and candidate species and species of concern for South Carolina. Please use this list to aid you in analyzing potential impacts your project may have on these species. Thank you.

(See attached file: listetcsc.wpd)

Lori A.W. Duncan
U.S. Fish and Wildlife Service
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407
(843) 727-4707 ext. 21
(843) 727-4218 fax
lori_duncan@fws.gov

**South Carolina Distribution Records of
Endangered, Threatened, Candidate and Species of Concern
March 8, 2001**

- E Federally endangered
 T Federally threatened
 P Proposed in the Federal Register
 CH Critical Habitat
 C The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
 S/A Federally protected due to similarity of appearance to a listed species
 SC Federal Species of concern. These species are rare or limited in distribution but are not currently legally protected under the Endangered Species Act.
 * Contact the National Marine Fisheries Service for more information on this species

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated continually and may be different from the following.

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrence</u>
Abbeville	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
Aiken	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Known
	Relict trillium	<i>Trillium reliquum</i>	E	Known
	Piedmont bishop-weed	<i>Ptilimnium nodosum</i>	E	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Dwarf burhead	<i>Echinodorus parvulus</i>	SC	Known
	Bog spicebush	<i>Lindera subcoriacea</i>	SC	Known
	Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
	Gopher frog	<i>Rana capito</i>	SC	Known
	Pickering's morning-glory	<i>Stylisma pickeringii</i> var. <i>pickeringii</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known	

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
Allendale				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Possible
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
	False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
	Yellow lampmussel	<i>Lampsilis cariosa</i>	SC	Known
	Savannah lilliput	<i>Toxolasma pullus</i>	SC	Known
Anderson				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Carolina darter	<i>Etheostoma collis</i>	SC	Known
Bamberg				
	Wood stork	<i>Mycteria americana</i>	E	Possible
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Possible
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Dwarf burhead	<i>Echinodorus parvulus</i>	SC	Known
	Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
	Chapman's sedge	<i>Carex chapmanii</i>	SC	Known
Barnwell				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Possible
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Pondberry	<i>Lindera melissifolia</i>	E	Possible

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
Barnwell (cont.)	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Piedmont bishop-weed	<i>Ptilimnium nodosum</i>	E	Known
	American chaffseed	<i>Schwalbea americana</i>	E	Possible
	Dwarf burhead	<i>Echinodorus parvulus</i>	SC	Known
	Awed meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Bog spicebush	<i>Lindera subcoriacea</i>	SC	Known
	Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
	Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
	Creeping St. John's wort	<i>Hypericum adpressum</i>	SC	Known
	Gopher frog	<i>Rana capito</i>	SC	Known
	Sandhills milk-vetch	<i>Astragalus michauxii</i>	SC	Known
	Yellow lampmussel	<i>Lampsilis cariosa</i>	SC	Known
Beaufort	West Indian manatee	<i>Trichechus manatus</i>	E	Known
	Finback whale	<i>Balaenoptera physalus*</i>	E	Known
	Humpback whale	<i>Megaptera novaeangliae*</i>	E	Known
	Northern right whale	<i>Eubaleana glacialis*</i>	E	Known
	Sei whale	<i>Balaenoptera borealis*</i>	E	Known
	Sperm whale	<i>Physeter catodon*</i>	E	Known
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Piping plover	<i>Charadrius melodus</i>	T/PCH	Known
	Kemp's ridley sea turtle	<i>Lepidochelys kempii*</i>	E	Known
	Leatherback sea turtle	<i>Dermochelys coriacea*</i>	E	Known
	Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
	Green sea turtle	<i>Chelonia mydas*</i>	T	Known
	Flatwoods salamander	<i>Ambystoma cingulatum</i>	T	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Pondberry	<i>Lindera melissifolia</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
	Chaff-seed	<i>Schwalbea americana</i>	E	Known
	Dusky shark	<i>Carcharhinus obscurus*</i>	C	Possible
<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>

Beaufort (cont.)

Sand tiger shark	<i>Odontaspis taurus*</i>	C	Possible
Night shark	<i>Carcharinus signatus*</i>	C	Possible
Speckled hind	<i>Epinephelus drummondhayi*</i>	C	Possible
Jewfish	<i>E. itijara*</i>	C	Possible
Warsaw grouper	<i>E. nigritus*</i>	C	Possible
Nassau grouper	<i>E. striatus*</i>	C	Possible
Cupgrass	<i>Eriochloa michauxii</i>	SC	Known
Pondspice	<i>Litsea aestivalis</i>	SC	Known
Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known

Berkeley

West Indian manatee	<i>Trichechus manatus</i>	E	Possible
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
Wood stork	<i>Mycteria americana</i>	E	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
Flatwoods salamander	<i>Ambystoma cingulatum</i>	T	Known
Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
Pondberry	<i>Lindera melissifolia</i>	E	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Chaff-seed	<i>Schwalbea americana</i>	E	Known
Awned meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
Chapman's sedge	<i>Carex chapmanii</i>	SC	Known
False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
Gopher frog	<i>Rana capito</i>	SC	Known
Incised groovebur	<i>Agrimonia incisa</i>	SC	Known
Least trillium	<i>Trillium pusillum var. pusillum</i>	SC	Known
Pineland plantain	<i>Plantago sparsiflora</i>	SC	Known
Pondspice	<i>Litsea aestivalis</i>	SC	Known
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Sun-facing coneflower	<i>Rudbeckia heliopsidis</i>	SC	Known

County

Common Name **Scientific Name** **Status** **Occurrences**

Calhoun

Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Possible
Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
Least trillium	<i>Trillium pusillum var. pusillum</i>	SC	Known

Charleston

West Indian manatee	<i>Trichechus manatus</i>	E	Known
Finback whale	<i>Balaenoptera physalus*</i>	E	Known
Humpback whale	<i>Megaptera novaeangliae*</i>	E	Known
Northern right whale	<i>Eubaleana glacialis*</i>	E	Known
Sei whale	<i>Balaenoptera borealis*</i>	E	Known
Sperm whale	<i>Physeter catodon*</i>	E	Known
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
Bachman's warbler	<i>Vermivora bachmanii</i>	E	Known
Wood stork	<i>Mycteria americana</i>	E	Known
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Piping plover	<i>Charadrius melodus</i>	T/CH	Known
Kemp's ridley sea turtle	<i>Lepidochelys kempii*</i>	E	Known
Leatherback sea turtle	<i>Dermochelys coriacea*</i>	E	Known
Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
Green sea turtle	<i>Chelonia mydas*</i>	T	Known
Flatwoods salamander	<i>Ambystoma cingulatum</i>	T	Known
Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
Sea-beach amaranth	<i>Amaranthus pumilus</i>	T	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
Pondberry	<i>Lindera melissifolia</i>	E	Possible
Chaff-seed	<i>Schwalbea americana</i>	E	Known
Dusky shark	<i>Carcharhinus obscurus*</i>	C	Possible
Sand tiger shark	<i>Odontaspis taurus*</i>	C	Possible
Night shark	<i>Carcharhinus signatus*</i>	C	Possible
Speckled hind	<i>Epinephelus drummondhayi*</i>	C	Possible
Jewfish	<i>E. itijara*</i>	C	Possible
Warsaw grouper	<i>E. nigritus*</i>	C	Possible
Nassau grouper	<i>E. striatus*</i>	C	Possible
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Known
Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
Gopher frog	<i>Rana capito</i>	SC	Known

County**Common Name****Scientific Name****Status Occurrences****Charleston
(cont.)**

Island glass lizard	<i>Ophisaurus compressus</i>	SC	Known
Incised groovebur	<i>Agrimonia incisa</i>	SC	Known
Pondspice	<i>Litsea aestivalis</i>	SC	Known
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
Sweet pinesap	<i>Monotropsis odorata</i>	SC	Known

	Venus' fly-trap	<i>Dionaea muscipula</i>	SC	Known
Cherokee	Dwarf-flowered heartleaf	<i>Hexastylis naniflora</i>	T	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
Chester	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Possible
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
Chesterfield	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Possible
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Known
	Carolina dropseed	<i>Sporobolus sp1</i>	SC	Known
	Pine or Gopher snake	<i>Pituophis melanoleucus</i>	SC	Known
	Spring-flowering goldenrod	<i>Solidago verna</i>	SC	Known
	Well's pixie-moss	<i>Pyxidantha brevifolia</i>	SC	Known
	Wire-leaved dropseed	<i>Sporobolus teretifolius</i>	SC	Known
County	Common Name	Scientific Name	Status	Occurrences
Clarendon	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Chaff-seed	<i>Schwalbea americana</i>	E	Known
	Awned meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
	Creeping St. John's wort	<i>Hypericum adpressum</i>	SC	Known
	Dwarf burhead	<i>Echinodorus parvulus</i>	SC	Known
	False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
Colleton				

	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Piping plover	<i>Charadrius melodus</i>	T/PCH	Known
	Kemp's ridley sea turtle	<i>Lepidochelys kempii*</i>	E	Known
	Leatherback sea turtle	<i>Dermochelys coriacea*</i>	E	Known
	Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
	Green sea turtle	<i>Chelonia mydas*</i>	T	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Pondberry	<i>Lindera melissifolia</i>	E	Possible
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Dusky shark	<i>Carcharhinus obscurus*</i>	C	Possible
	Sand tiger shark	<i>Odontaspis taurus*</i>	C	Possible
	Night shark	<i>Carcharinus signatus*</i>	C	Possible
	Speckled hind	<i>Epinephelus drummondhayi*</i>	C	Possible
	Jewfish	<i>E. itijara*</i>	C	Possible
	Warsaw grouper	<i>E. nigritus*</i>	C	Possible
	Nassau grouper	<i>E. striatus*</i>	C	Possible
	Carolina bird-in-a-nest	<i>Macbridea caroliniana</i>	SC	Known
	Crested fringed orchid	<i>Pteroglossaspis ecristata</i>	SC	Known
	Island glass lizard	<i>Ophisaurus compressus</i>	SC	Known
	Pondspice	<i>Litsea aestivalis</i>	SC	Known
Darlington	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Possible
	Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E	Known
County	Common Name	Scientific Name	Status	Occurrences
Darlington (cont.)	Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
	Georgia lead-plant	<i>Amorpha georgiana var. georgiana</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
	Sandhills milkvetch	<i>Astragalus michauxii</i>	SC	Known
	Spring-flowering goldenrod	<i>Solidago verna</i>	SC	Known
	Well's pixie-moss	<i>Pyxidantha brevifolia</i>	SC	Known
	White false-asphodel	<i>Tofieldia glabra</i>	SC	Known
Dillon				

	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Possible
	Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
	Falso coco	<i>Pteroglossaspis ecristata</i>	SC	Known
	Pine barrens bonneset	<i>Eupatorium resinsum</i>	SC	Known
Dorchester				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Possible
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Possible
	Pondberry	<i>Lindera melissifolia</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
	Bog asphodel	<i>Nartheccium americanum</i>	C	Known
	False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
	Gopher frog	<i>Rana capito</i>	SC	Known
	Least trillium	<i>Trillium pusillum var. pusillum</i>	SC	Known
	Pineland plantain	<i>Plantago sparsiflora</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
	Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
County	Common Name	Scientific Name	Status	Occurrences
Edgefield				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Known
	Miccosukee gooseberry	<i>Ribes echinellum</i>	T	Possible
	Relict trillium	<i>Trillium reliquum</i>	E	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Brook floater	<i>Alasmidonta varicosa</i>	SC	Known
	Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
	Yellow lampmussel	<i>Lampsilis cariosa</i>	SC	Known
Fairfield				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Carolina darter	<i>Etheostoma collis</i>	SC	Known
Florence				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known

	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Chaffseed	<i>Schwalbea americana</i>	E	Known
	Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
	Georgia lead-plant	<i>Amorpha georgiana</i> var. <i>georgiana</i>	SC	Known
	Ovate catchfly	<i>Silene ovata</i>	SC	Known
Georgetown				
	West Indian manatee	<i>Trichechus manatus</i>	E	Known
	Finback whale	<i>Balaenoptera physalus*</i>	E	Known
	Humpback whale	<i>Megaptera novaeangliae*</i>	E	Known
	Northern right whale	<i>Eubaleana glacialis*</i>	E	Known
	Sei whale	<i>Balaenoptera borealis*</i>	E	Known
	Sperm whale	<i>Physeter catodon*</i>	E	Known
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Wood stork	<i>Mycteria americana</i>	E	Known
County	Common Name	Scientific Name	Status	Occurrences
Georgetown (cont.)				
	Piping plover	<i>Charadrius melodus</i>	T/PCH	Known
	Kemp's ridley sea turtle	<i>Lepidochelys kempii*</i>	E	Known
	Leatherback sea turtle	<i>Dermochelys coriacea*</i>	E	Known
	Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
	Green sea turtle	<i>Chelonia mydas*</i>	T	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Sea-beach amaranth	<i>Amaranthus pumilus</i>	T	Known
	Pondberry	<i>Lindera melissifolia</i>	E	Possible
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
	Chaffseed	<i>Schwalbea americana</i>	E	Possible
	Dusky shark	<i>Carcharhinus obscurus*</i>	C	Possible
	Sand tiger shark	<i>Odontaspis taurus*</i>	C	Possible
	Night shark	<i>Carcharhinus signatus*</i>	C	Possible
	Speckled hind	<i>Epinephelus drummondhayi*</i>	C	Possible
	Jewfish	<i>E. itijara*</i>	C	Possible
	Warsaw grouper	<i>E. nigritus*</i>	C	Possible
	Nassau grouper	<i>E. striatus*</i>	C	Possible
	Awmed meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Bachman's sparrow	<i>Aimophia aestivalis</i>	SC	Known
	Carolina pygmy sunfish	<i>Elassoma boehlkei</i>	SC	Known

	Carolina grass-of-parnassus	<i>Parnassia caroliniana</i>	SC	Known
	Dune bluecurls	<i>Trichostema sp 1</i>	SC	Known
	One-flower balduina	<i>Balduina uniflora</i>	SC	Known
	Pineland plantain	<i>Plantago sparsiflora</i>	SC	Known
	Pondspice	<i>Litsea aestivalis</i>	SC	Known
	Reclined meadow-rue	<i>Thalictrum subrotundum</i>	SC	Known
	Wire-leaved dropseed	<i>Sporobolus teretifolius</i>	SC	Known
	Venus' fly-trap	<i>Dionaea muscipula</i>	SC	Known
Greenville				
	Bog turtle	<i>Clemmys muhlenbergii</i>	T S/A	Known
	Swamp-pink	<i>Helonias bullata</i>	T	Known
	Dwarf-flowered heartleaf	<i>Hexastylis naniflora</i>	T	Known
	Small whorled pogonia	<i>Isotria medeoloides</i>	T	Known
	Bunched arrowhead	<i>Sagittaria fasciculata</i>	E	Known
	Mountain sweet pitcher-plant	<i>Sarracenia rubra ssp. jonesii</i>	E	Known
	White irisette	<i>Sisyrinchium dichotomum</i>	E	Known
	Rock gnome lichen	<i>Gymnoderma lineare</i>	E	Known
	White fringeless orchid	<i>Platanthera integrilabia</i>	C	Known
	Green salamander	<i>Aneides aeneus</i>	SC	Known
County	Common Name	Scientific Name	Status	Occurrences
Greenville (cont.)				
	Oconee-bells	<i>Shortia galacifolia</i>	SC	Known
	Piedmont ragwort	<i>Senecio millefolium</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
	Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
	Southern Appalachian woodrat	<i>Neotoma floridana haematoreia</i>	SC	Known
	Sweet pinesap	<i>Monotropsis odorata</i>	SC	Known
Greenwood				
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Known
Hampton				
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Wood stork	<i>Mycteria americana</i>	E	Known
	Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	Possible
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known

	Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
	Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
	Chapman's sedge	<i>Carex chapmanii</i>	SC	Known
	False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
	Gopher frog	<i>Rana capito</i>	SC	Known
	Pine or Gopher snake	<i>Pituophis melanoleucus</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
Horry				
	West Indian manatee	<i>Trichechus manatus</i>	E	Known
	Finback whale	<i>Balaenoptera physalus*</i>	E	Known
	Humpback whale	<i>Megaptera novaeangliae*</i>	E	Known
	Northern right whale	<i>Eubaleana glacialis*</i>	E	Known
	Sei whale	<i>Balaenoptera borealis*</i>	E	Known
	Sperm whale	<i>Physeter catodon*</i>	E	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Known
	Piping plover	<i>Charadrius melodus</i>	T/PCH	Known
County	Common Name	Scientific Name	Status	Occurrences
Horry (cont.)				
	Kemp's ridley sea turtle	<i>Lepidochelys kempii*</i>	E	Known
	Leatherback sea turtle	<i>Dermochelys coriacea*</i>	E	Known
	Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
	Green sea turtle	<i>Chelonia mydas*</i>	T	Possible
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Sea-beach amaranth	<i>Amaranthus pumilus</i>	T	Known
	Pondberry	<i>Lindera melissifolia</i>	E	Possible
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
	Chaff-seed	<i>Schwalbea americana</i>	E	Known
	Dusky shark	<i>Carcharhinus obscurus*</i>	C	Possible
	Sand tiger shark	<i>Odontaspis taurus*</i>	C	Possible
	Night shark	<i>Carcharhinus signatus*</i>	C	Possible
	Speckled hind	<i>Epinephelus drummondhayi*</i>	C	Possible
	Jewfish	<i>E. itijara*</i>	C	Possible
	Warsaw grouper	<i>E. nigritus*</i>	C	Possible
	Nassau grouper	<i>E. striatus*</i>	C	Possible
	Dwarf burhead	<i>Echinodorus parvalus</i>	SC	Known
	Carolina grass-of parnassus	<i>Parnassia caroliniana</i>	SC	Known

Crested fringed orchid	<i>Pteroglossaspis ecristata</i>	SC	Known
Dwarf burhead	<i>Echinodorus parvulus</i>	SC	Known
Harper's fimbristylis	<i>Fimbristylis perpusilla</i>	SC	Known
One-flower balduina	<i>Balduina uniflora</i>	SC	Known
Pickering's morning-glory	<i>Stylisma pickeringii</i> var.	SC	Known
	<i>pickeringii</i>		
Piedmont cowbane	<i>Oxypolis ternata</i>	SC	Known
Pine or Gopher snake	<i>Pituophis melanoleucus</i>	SC	Known
Pineland plantain	<i>Plantago sparsiflora</i>	SC	Known
Pondspice	<i>Litsea astivalis</i>	SC	Known
Venus' fly-trap	<i>Dionaea muscipula</i>	SC	Known
Well's Pyxie Moss	<i>Pyxidantha barbulata</i> var.	SC	Known
	<i>barbulata</i>		
White false-asphodel	<i>Tofieldia glabra</i>	SC	Known
Wire-leaved dropseed	<i>Sporobolus teretifolius</i>	SC	Known

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
Jasper	West Indian manatee	<i>Trichechus manatus</i>	E	Known
	Finback whale	<i>Balaenoptera physalus</i>	E	Known
	Humpback whale	<i>Megaptera novaeangliae</i>	E	Known
	Right whale	<i>Eubaleana glacialis</i>	E	Known
	Sei whale	<i>Balaenoptera borealis</i>	E	Known
	Sperm whale	<i>Physeter catodon</i>	E	Known
	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Wood stork	<i>Mycteria americana</i>	E	Known
	Piping plover	<i>Charadrius melodus</i>	T	Possible
	Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	Possible
	Kemp's ridley sea turtle	<i>Lepidochelys kempii</i> *	E	Known
	Leatherback sea turtle	<i>Dermodochelys coriacea</i> *	E	Known
	Loggerhead sea turtle	<i>Caretta caretta</i>	T	Known
	Green sea turtle	<i>Chelonia mydas</i> *	T	Possible
	Flatwoods salamander	<i>Ambystoma cingulatum</i>	T	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Known
	Pondberry	<i>Lindera melissifolia</i>	E	Possible
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
	Chaff-seed	<i>Schwalbea americana</i>	E	Known
	Dusky shark	<i>Carcharhinus obscurus</i> *	C	Possible
	Sand tiger shark	<i>Odontaspis taurus</i> *	C	Possible

Night shark	<i>Carcharinus signatus*</i>	C	Possible
Speckled hind	<i>Epinephelus drummondhayi*</i>	C	Possible
Jewfish	<i>E. itijara*</i>	C	Possible
Warsaw grouper	<i>E. nigrurus*</i>	C	Possible
Nassau grouper	<i>E. striatus*</i>	C	Possible
Bachman's sparrow	<i>Aimophila aestivalis</i>	SC	Known
Creeping St. Johns-wort	<i>Hypericum adpressum</i>	SC	Known
Crested fringed orchid	<i>Pteroglossaspis ecristata</i>	SC	Known
Florida pine snake	<i>Pituophis melanoleucus</i>	SC	Known
Mimic glass lizard	<i>Ophisaurus mimicus</i>	SC	Known
Pine or Gopher snake	<i>Pituophis melanoleucus</i>	SC	Known
Pineland plantain	<i>Plantago sparsiflora</i>	SC	Known
Pondspice	<i>Litsea aestivalis</i>	SC	Known
Yellow lampmussel	<i>Lampsilis cariosa</i>	SC	Known

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
Kershaw	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Known
	Michaux's sumac	<i>Rhus michauxii</i>	E	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Carolina pygmy sunfish	<i>Elassoma boehlkei</i>	SC	Known
	One-flower stitchwort	<i>inuartia uniflora</i>	SC	Known
	Pondspice	<i>Litsea aestivalis</i>	SC	Known
	Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
	White-false-asphodel	<i>Tofieldia glabra</i>	SC	Known
	White-wicky	<i>Kalmia cuneata</i>	SC	Known
	Wire-leaved dropseed	<i>Sporobolus teretifolius</i>	SC	Known
Lancaster	Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Known
	Little amphianthus	<i>Amphianthus pusillus</i>	T	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	E	Known
	Black-spored quillwort	<i>Isoetes melanospora</i>	E	Known
	Brook floater	<i>Alasmidonta varicosa</i>	SC	Known
	Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known

Laurens	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Georgia aster	<i>Aster georganus</i>	C	Known
Lee	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Chaffseed	<i>Schwalbea americana</i>	E	Known
	Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
County	Common Name	Scientific Name	Status	Occurrences
Lexington	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Possible
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Possible
	Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	E	Known
	Pickering's morning-glory	<i>Stylisma pickeringii</i> var.	SC	Known
		<i>pickeringii</i>		
	Piedmont cowbane	<i>Oxypolis ternata</i>	SC	Known
	Rayner's blueberry	<i>Vaccinium crassifolium</i> ssp.	SC	Known
	<i>sempervirens</i>			
	Shoal's spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
Marion	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Wood stork	<i>Mycteria americana</i>	E	Possible
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Yellow lampmussel	<i>Lampsilis cariosa</i>	SC	Known
Marlboro	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Possible
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Possible
	Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Pickering's morning-glory	<i>Stylisma pickeringii</i> var.	SC	Known
		<i>pickeringii</i>		
	Spring-flowering goldenrod	<i>Solidago verna</i>	SC	Known
Yellow lampmussel	<i>Lampsilis cariosa</i>	SC	Known	

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
McCormick	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Known
	Micosukee gooseberry	<i>Ribes echinellum</i>	T	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Brook floater	<i>Alasmidonta varicosa</i>	SC	Known
	Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
	Yellow lampmussel	<i>Lampsilis cariosa</i>	SC	Known
Newberry	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Saluda crayfish	<i>Distocambarus youngineri</i>	SC	Known
	Sweet pinesap	<i>Monotropsis odorata</i>	SC	Known
Oconee	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Small whorled pogonia	<i>Isotria medeoloides</i>	T	Known
	Persistent trillium	<i>Trillium persistens</i>	E	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Brook floater	<i>Alasmidonta varicosa</i>	SC	Known
	Fort mountain sedge	<i>Carex amplisquama</i>	SC	Known
	Fraser loosestrife	<i>Lysimachia fraseri</i>	SC	Known
	Green salamander	<i>Aneides aeneus</i>	SC	Known
	Hellbender	<i>Cryptobranchus alleganiensis</i>	SC	Known
	Manhart's sedge	<i>Carex manhartii</i>	SC	Known
	Oconee-bells	<i>Shortia galacifolia</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
	Southern appalachian woodrat	<i>Neotoma floridana haematoreia</i>	SC	Known
	Sun-facing coneflower	<i>Rudbeckia heliopsidis</i>	SC	Known
Sweet pinesap	<i>Monotropsis odorata</i>	SC	Known	
Orangeburg	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Flatwoods salamander	<i>Ambystoma cingulatum</i>	T	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
	Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SC	Known
	Gopher frog	<i>Rana capito</i>	SC	Known
	Incised groovebur	<i>Agrimonia incisa</i>	SC	Known
	Pondspice	<i>Litsea aestivalis</i>	SC	Known
	Southeastern myotis	<i>Myotis austroriparius</i>	SC	Known
Pickens	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Possible
	Bog turtle	<i>Clemmys muhlenbergii</i>	T S/A	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Dwarf-flowered heartleaf	<i>Hexastylis naniflora</i>	T	Possible
	Black-spored quillwort	<i>Isoetes melanospora</i>	E	Known
	Mountain sweet pitcher-plant	<i>Sarracenia rubra ssp. jonesii</i>	E	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Alexander's rock aster	<i>Aster avitus</i>	SC	Known
	Fort Mountain sedge	<i>Carex amplisquana</i>	SC	Known
	Green salamander	<i>Aneides aeneus</i>	SC	Known
	Oconee-bells	<i>Shortia galacifolia</i>	SC	Known
	Biltmore greenbrier	<i>Smilax biltmoreana</i>	SC	
	Manhart sedge	<i>Carex manhartii</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
	Southern appalachian woodrat	<i>Neotoma floridana haematoreaia</i>	SC	Known
	Sweet pinesap	<i>Monotropsis odorata</i>	SC	Known
Richland	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
	Smooth coneflower	<i>Echinacea laevigata</i>	E	Known
	Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Awnead meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Bog spicebush	<i>Lindera subcoriacea</i>	SC	Known
	Carolina bogmint	<i>Macbridea caroliniana</i>	SC	Known
	Carolina darter	<i>Etheostoma collis</i>	SC	Known

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
	Creeping St. John's wort	<i>Hypericum adpressum</i>	SC	Known
	False coco	<i>Pteroglossaspis ecristata</i>	SC	Known
	Purple balduina	<i>Balduina atropurpurea</i>	SC	Known
	Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	SC	Known
	Rayner's blueberry	<i>Vaccinium crassifolium</i> ssp. <i>empervirens</i>	SC	Known
	Sandhills milk-vetch	<i>Astragalus michauxii</i>	SC	Known
	Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
	Southern hognose snake	<i>Heterodon simus</i>	SC	Known
	White false-asphodel	<i>Tofieldia glabra</i>	SC	Known
Saluda	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Little amphianthus	<i>Amphianthus pusillus</i>	T	Known
	Piedmont bishop-weed	<i>Ptilimnium nodosum</i>	E	Known
	Creeping St. John's wort	<i>Hypericum adpressum</i>	SC	Known
	Dwarf burhead	<i>Echinodorus parvulus</i>	SC	Known
	Savannah lilliput	<i>Toxolasma pullus</i>	SC	Known
Spartanburg	Dwarf-flowered heartleaf	<i>Hexastylis naniflora</i>	T	Known
	Sweet pinesap	<i>Monotropsis odorata</i>	SC	Known
Sumter	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
	Shortnose sturgeon	<i>Acipenser brevirostrum</i> *	E	Known
	Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
	Chaff-seed	<i>Schwalbea americana</i>	E	Known
	Dwarf burhead	<i>Echinodorus parvulus</i>	SC	Known
	Awed meadowbeauty	<i>Rhexia aristosa</i>	SC	Known
	Boykin's lobelia	<i>Lobelia boykinii</i>	SC	Known
Union	Georgia aster	<i>Aster georgianus</i>	C	Known
	Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
	Sweet pinesap	<i>Monotropsis odorata</i>	SC	Known
Williamsburg	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Wood stork	<i>Mycteria americana</i>	E	Possible

Red-cockaded woodpecker	<i>Picoides borealis</i>	E	Known
Shortnose sturgeon	<i>Acipenser brevirostrum*</i>	E	Known
Canby's dropwort	<i>Oxypolis canbyi</i>	E	Known
Chaff-seed	<i>Schwalbea americana</i>	E	Known

<u>County</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Occurrences</u>
York	Bald eagle	<i>Haliaeetus leucocephalus</i>	T	Known
	Little amphianthus	<i>Amphianthus pusillus</i>	T	Known
	Schweinitz' sunflower	<i>Helianthus schweinitzii</i>	E	Known
	Dwarf-flowered heartleaf	<i>Hexastylis naniflora</i>	T	Possible
	Georgia aster	<i>Aster georgianus</i>	C	Known
	Carolina darter	<i>Etheostoma collis</i>	SC	Known
	Shoals spider-lily	<i>Hymenocallis coronaria</i>	SC	Known
	Sun-facing coneflower	<i>Rudbeckia heliopsidis</i>	SC	Known

South Carolina Department of Natural Resources



Paul A. Sandifer, Ph.D.
Director

William S. McTeer
Deputy Director for
**Wildlife and
Freshwater Fisheries**

February 15, 2001

Stephen A. Byrne, Vice President, Nuclear Operations
SCE&G, Virgil C. Summer Nuclear Station
P.O. Box 88
Jenkinsville, SC 29065

RE: Virgil C. Summer Nuclear Station License Renewal
Request for Information on Listed Species and Important Habitats

Dear Mr. Byrne,

I have checked our database, and there are no occurrences of any federally or state threatened or endangered species within one mile of the project area. There are a number of known Bald Eagle nesting sites within a five mile radius. I've included a map indicating those locations for your information. Please understand that our database does not represent a comprehensive biological inventory of the state. Field work remains the responsibility of the investigator.

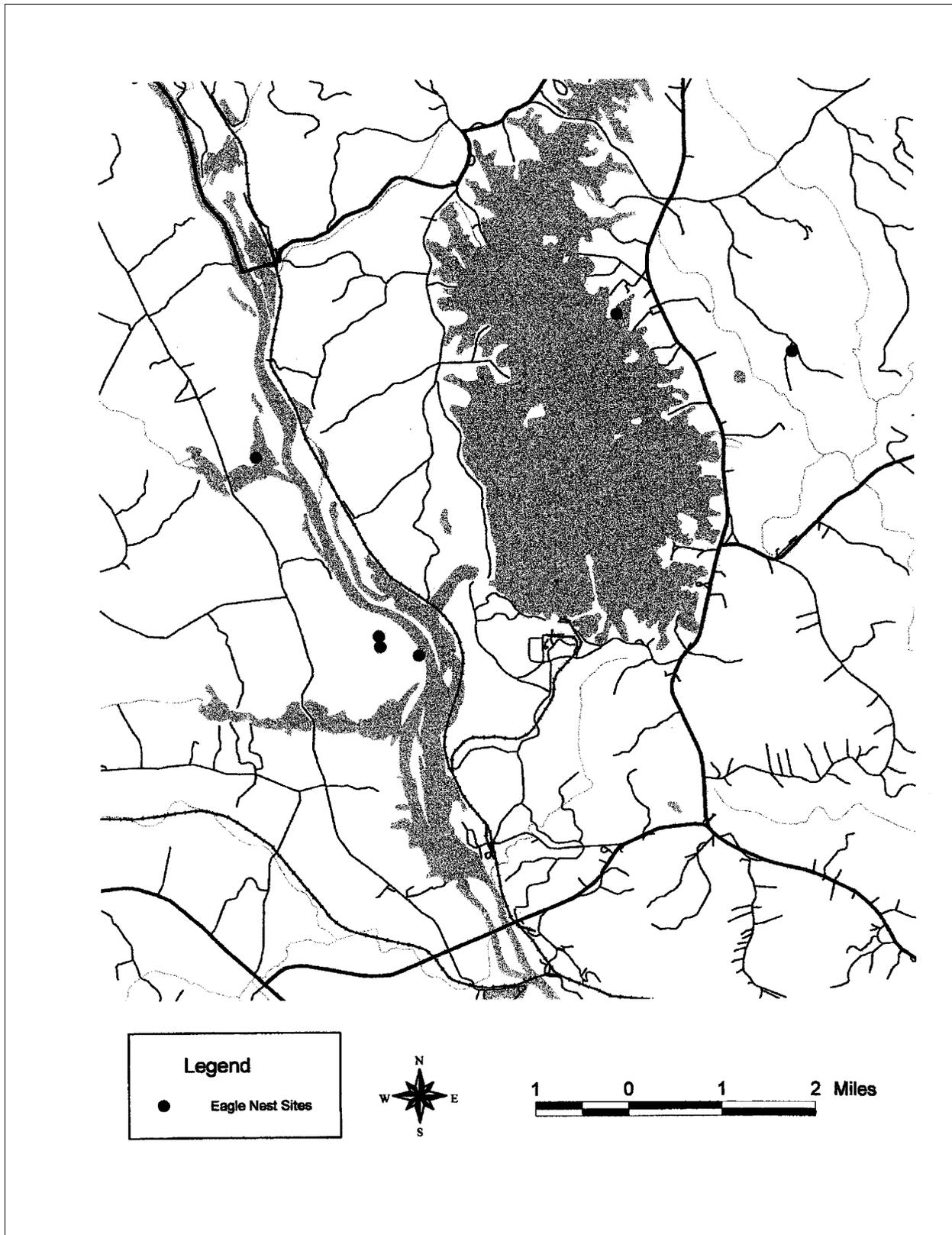
As an indication of other potential occurrences in the area, I have enclosed the lists of rare and endangered species for Fairfield, Newberry, and Richland counties. The highlighted ones are of legal significance. The remaining species on the list are of concern in the state.

If you need additional assistance, please contact me by phone at 803/734-3917 or by e-mail at JulieH@scdnr.state.sc.us.

Sincerely,

A handwritten signature in cursive script that reads "Julie Holling".

Julie Holling
SC Department of Natural Resources
Heritage Trust Program



RARE, THREATENED, AND ENDANGERED SPECIES OF FAIRFIELD COUNTY

STATUS... GRANK... SRANK... SCIENTIFIC NAME..... COMMON NAME.....
 ANIMALS:

SC	G3	S?	ETHEOSTOMA COLLIS	CAROLINA DARTER
FT/SE	G4	S2	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE
SC	G5	S?	PYGANODON CATARACTA	EASTERN FLOATER
SC	G5	S4	SCIURUS NIGER	EASTERN FOX SQUIRREL
SC	G4	S?	VILLOSA DELUMBIS	EASTERN CREEKSHELL

PLANTS:

SC	G2G3	S?	ASTER GEORGIANUS	GEORGIA ASTER
SC	G4	S?	CAREX OLIGOCARPA	EASTERN FEW-FRUIT SEDGE
SC	G4	S?	DIRCA PALUSTRIS	EASTERN LEATHERWOOD
RC	G5	S1	FRASERA CAROLINIENSIS	COLUMBO
SC	G3	S2	ISOETES PIEDMONTANA	PIEDMONT QUILLWORT
SC	G4	S?	MINUARTIA UNIFLORA	ONE-FLOWER STITCHWORT
SC	G5	S?	OSMORHIZA CLAYTONII	HAIRY SWEET-CICELY
SC	G5	S1	PHILADELPHUS HIRSUTUS	STREAMBANK MOCK-ORANGE
SC	G4	S?	SCUTELLARIA PARVULA	SMALL SKULLCAP
NC	G3	S2	SEDUM PUSILLUM	GRANITE ROCK STONECROP

RARE, THREATENED, AND ENDANGERED SPECIES OF LEXINGTON COUNTY

STATUS...	GRANK....	SRANK...	SCIENTIFIC NAME.....	COMMON NAME.....
ANIMALS:				
FT/SE	G4	S2	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE
SC	G2	S?	HETERODON SIMUS	SOUTHERN HOGNOSE SNAKE
SC	G5	S2	MICRURUS FULVIUS	EASTERN CORAL SNAKE
FE/SE	G3	S2	PICOIDES BOREALIS	RED-COCKADED WOODPECKER
SC	G5	S4	SCIURUS NIGER	EASTERN FOX SQUIRREL
SC	G5	S?	SEMINATRIX PYGAEA	BLACK SWAMP SNAKE
PLANTS:				
SC	G5T3T4	S1	ANDROPOGON PERANGUSTATUS	NARROW LEAVED BLUESTEM
SC	G4?	S?	ARISTIDA CONDENSATA	PIEDMONT THREE-AWNED GRASS
SC	G4	S1	ASPLENIUM PINNATIFIDUM	LOBED SPLEENWORT
SC	G4G5	S?	BURMANNIA BIFLORA	NORTHERN BURMANNIA
SC	G4	S1	CAREX COLLINSII	COLLINS' SEDGE
SC	G4G5	S1S2	CHRYSOMA PAUCIFLOSCULOSA	WOODY GOLDENROD
SC	G3G5	S?	CORBOPSIS GLADIATA	SOUTHEASTERN TICKSEED
SC	G5	S1	EUONYMUS ATROPURPUREUS	WAHOO
SC	G4	S?	GAYLUSSACIA MOSTERI	WOOLLY-BERRY
NC	G2Q	S2	HYMENOCALLIS CORONARIA	SHOALS SPIDER-LILY
SC	G4	S?	HYPERICUM NITIDUM	CAROLINA ST. JOHN'S-WORT
SC	G4	S3	ILEX AMELANCHIER	SARVIS HOLLY
SC	G3G4	S?	LIATRIS MICROCEPHALA	SMALL-HEAD GAYFEATHER
SC	G?	S?	LOBELIA SP 1	LOBELIA
SC	G3	S?	LYCOPUS COKERI	CAROLINA BUGLEWEED
SC	G5	S?	MENISPERMUM CANADENSE	CANADA MOONSEED
RC	G3	S2	MYRIOPHYLLUM LAXUM	PIEDMONT WATER-MILFOIL
SC	G3G5	S?	NOLINA GEORGIANA	GEORGIA BEARGRASS
SC	G3	S?	OXYPOLIS TERNATA	PIEDMONT COWBANE
SC	G4	S?	PITYOPSIS PINIFOLIA	PINE-LEAVED GOLDEN ASTER
SC	G5	S1S2	POLYGALA NANA	DWARF MILKWORT
SC	G5	S1	RHYNCHOSPORA ALBA	WHITE BEAKRUSH
SC	G3G4	S?	RHYNCHOSPORA INUNDATA	DROWNED HORNEDRUSH
	G3	SR	RHYNCHOSPORA LEPTOCARPA	
SC	G4	S?	RHYNCHOSPORA STENOPHYLLA	CHAPMAN BEAKRUSH
SC	G5	S?	RORIPPA SESSILIFLORA	STALKLESS YELLOWCRESS
SC	G3G4	S2	SAGITTARIA ISOETIFORMIS	SLENDER ARROW-HEAD
SC	G3	S1	SARRACENIA RUBRA	SWEET PITCHER-PLANT
SC	G4G5	S?	SCIRPUS SUBTERMINALIS	WATER BULRUSH
NC	G1G2	S1	SPOROBOLUS TERETIFOLIUS	WIRE-LEAVED DROPSEED
SC	G4T2T3	S1	STYLISMA PICKERINGII VAR PICKERINGII	PICKERING'S MORNING-GLORY
SC	G3?	S?	TRIDENS CAROLINIANUS	CAROLINA FLUFF GRASS
NC	G4G5T1	S1	VACCINIUM CRASSIFOLIUM SSP SEMPERVIRENS	RAYNER'S BLUEBERRY
SC	G3	S?	XYRIS CHAPMANII	CHAPMAN'S YELLOW-EYED GRASS

RARE, THREATENED, AND ENDANGERED SPECIES OF NEWBERRY COUNTY

STATUS.. GRANK..SRANK... SCIENTIFIC NAME..... COMMON NAME.....

ANIMALS:

SC	G1	S1	DISTOCAMBARUS YOUNGINERI	A CRAYFISH
SC	G2G3	S?	ELLIPTIO LANCEOLATA	YELLOW LANCE
FT/SE	G4	S2	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE
SC	G5	S3?	URSUS AMERICANUS	BLACK BEAR

PLANTS:

SC	G4	S?	DIRCA PALUSTRIS	EASTERN LEATHERWOOD
SC	G5?	S?	EUPATORIUM FISTULOSUM	HOLLOW JOE-PYE WEED
RC	G5	S1	FRASERA CAROLINIENSIS	COLUMBO
SC	G5	S?	HETERANTHERA RENIFORMIS	KIDNEYLEAF MUD-PLANTAIN
SC	G5	S?	LIPARIS LILIIFOLIA	LARGE TWAYBLADE
RC	G4	S1	MAGNOLIA PYRAMIDATA	PYRAMID MAGNOLIA
RC	G3	S1	MONOTROPSIS ODDORATA	SWEET PINESAP
SC	G5T5	S?	VIOLA PUBESCENS VAR LEIOCARPON	YELLOW VIOLET

APPENDIX B

Photographs



Photo 1. View of VCSNS generating facilities from the discharge canal area.



Photo 2. Gullied transmission corridor immediately east of Parr Reservoir.



Photo 3. Sand-thistle (*Cirsium repandum*).



Photo 4. Little River, with Richland County (east) bank in foreground and Fairfield County (west) bank in background. (Denny Terrace Site D5)



Photo 5. Thin-leaved mountain mint (*Pycnanthemum tenuifolium*).



Photo 6. Climbing milkweed (*Gonolobus suberosus*).



Photo 7. View of Columbia skyline from area of Columbia International University (Denny Terrace Site D11)



Photo 8. Cow-itch vine (*Campsis radicans*).



Photo 9. Manroot (*Ipomoea pandurata*).



Photo 10. Crane Creek, view to west. The photo is taken from SC 215.
(Denny Terrace Site D14)



Photo 11. Bishop's weed (*Ptilimnium capillaceum*).



Photo 12. View toward Parr Reservoir from south (Newberry) side of Cannons Creek (Graniteville Site G1).



Photo 13. Sneezeweed (*Senecio anonymus*).



Photo 14. Butterfly weed (*Asclepias tuberosa*), with Indian pink (*Spigelia marilandica*) visible just left of center.



Photo 15. Goats and pastureland (Graniteville Site G10).



Photo 16. Bogmint (*Macbridea caroliniana*).



Photo 17. Pink meadow beauty (*Rhexia mariana* var. *maniana*).



Photo 18. Jointweed (*Polygonella americana*).



Photo 19. Lloyd's hypericum (*Hypericum lloydii*).



Photo 20. Sandhill morning-glory (*Stylisma patens*).



Photo 21. Sticky foxglove (*Aureolaria pectinata*).



Photo 22. Narrow-leaf ironweed (*Vernonia angustifolia*).



Photo 23. Tread-softly (*Cnidoscolus stimulosus*).



Photo 24. False dandelion (*Pyrrhopappus carolinianus*).



Photo 25. Helenium (*Helenium flexuosum*).



Photo 26. Bear's paw (*Polymnia uvedalia*).



Photo 27. Indian pink (*Spigelia marilandica*).



Photo 28. View of active beaver pond, Newberry Site N8.



Photo 29. Blue skullcap (*Scutellaria integrifolia*).

APPENDIX C

Scientific Names of Plants Mentioned in Report

Plant species at VCSNS (bold taxa potentially present, not observed)
(alphabetized by common name)

Common Name	Scientific Name
American ash	<i>Fraxinus americana</i>
American beauty-berry	<i>Callicarpa americana</i>
American beech	<i>Fagus grandifolia</i>
American columbo	<i>Frasera caroliniensis</i>
American holly	<i>Ilex opaca</i>
Angelica	<i>Angelica venenosa</i>
Annual fescue	<i>Vulpia octoflora</i>
Bahia grass	<i>Paspalum notatum</i>
Beakrush	<i>Rhynchospora caduca</i>
Beakrush	<i>Rhynchospora chalarocephala</i>
Beard-tongue	<i>Penstemon australis</i>
Bear's paw	<i>Polymnia uvedalia</i>
Bee-mint	<i>Blephilia ciliata</i>
Bell-wort	<i>Uvularia sessilifolia</i>
Bighead lespedeza	<i>Lespedeza capitata</i>
Bishop's weed	<i>Ptilimnium capillaceum</i>
Black cherry	<i>Prunus serotina</i>
Black cohosh	<i>Cimicifuga racemosa</i>
Black gum	<i>Nyssa sylvatica</i>
Black oak	<i>Quercus velutina</i>
Black walnut	<i>Juglans nigra</i>
Black willow	<i>Salix nigra</i>
Blackberry	<i>Rubus argutus</i>
Black-eyed susan	<i>Rudbeckia fulgida</i>
Blackjack oak	<i>Quercus marilandica</i>
Blue skullcap	<i>Scutellaria integrifolia</i>
Blue-eyed grass	<i>Sisyrinchium atlanticum</i>
Bog-mint	<i>Macbridea caroliniana</i>
Box elder	<i>Acer negundo</i>
Bracken fern	<i>Pteridium aquilinum</i>
Broomstraw	<i>Andropogon virginicus</i>
Burning tragia	<i>Tragia urticifolia</i>
Butterfly pea	<i>Centrosema virginiana</i>
Butterfly-weed	<i>Asclepias tuberosa</i>
Camphor-weed	<i>Pluchea foetida</i>
Canarygrass	<i>Phalaris caroliniensis</i>
Carolina rose	<i>Rosa carolina</i>
Cattail	<i>Typha latifolia</i>
Chalky-stem sunflower	<i>Helianthus divaricatus</i>
Cheat	<i>Bromus secalinus</i>
Chestnut oak	<i>Quercus prinus</i>
Christman fern	<i>Polystichum acrostichoides</i>
Chrysanthemum	<i>Chrysanthemum leucanthemum</i>
Cinnamon vine	<i>Dioscorea villosa</i>
Cleavers	<i>Galium aparine</i>
Climbing hemp	<i>Mikania scandens</i>
Climbing hydrangea	<i>Decumaria barbara</i>

Climbing milkweed	<i>Gonolobus gonocarpus</i>
Corn salad	<i>Valerianella radiata</i>
Cow-itch vine	<i>Campsis radicans</i>
Crossvine	<i>Bignonia capreolata</i>
Cucumber tree	<i>Magnolia acuminata</i>
Cudweed	<i>Facelis retusa</i>
Cutleaf primrose	<i>Oenothera laciniata</i>
Dallis grass	<i>Paspalum dilatatum</i>
Deciduous holly	<i>Ilex decidua</i>
Desmodium	<i>Desmodium nudum</i>
Devil's shoestring	<i>Tephrosia virginiana</i>
Dewberry	<i>Rubus cuneifolius</i>
Dogbane	<i>Apocynum cannabinum</i>
Dog-fennel	<i>Eupatorium capillifolium</i>
Dogwood	<i>Cornus florida</i>
Duck potato	<i>Sagittaria latifolia</i>
Dwarf meadow beauty	<i>Rhexia petiolata</i>
Ebony spleenwort	<i>Asplenium platyneuron</i>
Elderberry	<i>Sambucus canadensis</i>
False dandelion	<i>Krigia virginica</i>
False dandelion	<i>Pyrrhopappus carolinianus</i>
False indigo	<i>Indigofera caroliniana</i>
False nettle	<i>Boehmeria cylindrica</i>
Fescue	<i>Festuca elatior</i>
Field croton	<i>Croton capitatus</i>
Field onion	<i>Allium canadense</i>
Fireweed	<i>Erechtites hieracifolia</i>
Flannelplant	<i>Verbascum thapsus</i>
Flea-bane	<i>Erigeron strigosus</i>
Florida maple	<i>Acer floridanum</i>
Foxtail clubmoss	<i>Lycopodium alopecuroides</i>
Fragrant croton	<i>Croton septentrionalis</i>
Fragrant sumac	<i>Rhus aromatica</i>
Frost flower	<i>Helianthemum rosmarinifolium</i>
Geranium	<i>Geranium maculatum</i>
Golden alexander	<i>Zizia trifoliata</i>
Gooseberry	<i>Vaccinium stamineum</i>
Granddaddy greybeard	<i>Chionanthus virginicus</i>
Green milkweed	<i>Asclepias viridiflora</i>
Ground cherry	<i>Physalis viscosa</i>
Hackberry	<i>Celtis laevigata</i>
Hairgrass	<i>Aira elegans</i>
Hairy brome	<i>Bromus commutatus</i>
Harparella	<i>Ptilmnum nodosum</i>
Heal-all	<i>Prunella vulgaris</i>
Helenium	<i>Helenium flexuosum</i>
Heliotrope	<i>Heliotropium amplexicaule</i>
Hepatica	<i>Hepatica americana</i>
High-pond hypericum	<i>Hypericum adpressum</i>
Highway lespedeza	<i>Lespedeza cuneata</i>
Himalaya berry	<i>Rubus bifrons</i>

Hop hornbeam	<i>Ostrya virginiana</i>
Horse nettle	<i>Solanum carolinense</i>
Indian cherry	<i>Rhamnus caroliniana</i>
Indian chickweed	<i>Mollugo verticillata</i>
Indian pink	<i>Spigelia marilandica</i>
Ironweed	<i>Vernonia acaulis</i>
Ironwood	<i>Carpinus caroliniana</i>
Italian ryegrass	<i>Lolium perenne</i>
Joe-pye weed	<i>Eupatorium dubium</i>
Johnson grass	<i>Sorghum halapense</i>
Jointweed	<i>Polygonella americana</i>
Ladies' tresses	<i>Spiranthes cernua</i>
Ladino clover	<i>Trifolium repens</i>
Licorice goldenrod	<i>Solidago odorata</i>
Little nutrush	<i>Scleria oligantha</i>
Lizard's tail	<i>Saururus cernuus</i>
Lloyd's hypericum	<i>Hypericum lloydii</i>
Loblolly pine	<i>Pinus taeda</i>
Longleaf pine	<i>Pinus palustris</i>
Lyre-leaved sage	<i>Salvia lyrata</i>
Mall grass	<i>Eragrostis curvula</i>
Manna grass	<i>Glyceria septentrionalis</i>
Manroot	<i>Ipomoea pandurata</i>
Mayapple	<i>Podophyllum peltatum</i>
Maypop	<i>Passiflora incarnata</i>
Mockernut hickory	<i>Carya tomentosa</i>
Monkey flower	<i>Mimulus ringens</i>
Moth mullein	<i>Verbascum blattaria</i>
Mountain laurel	<i>Kalmia latifolia</i>
Mountain mint	<i>Pycnanthemum tenuifolium</i>
Muscadine	<i>Vitis rotundifolia</i>
Nanny-berry	<i>Viburnum prunifolium</i>
Narrow-leaf beakrush	<i>Rhynchospora stenophylla</i>
Narrow-leaf ironweed	<i>Vernonia angustifolia</i>
Narrow-leaf milkweed	<i>Asclepias verticillata</i>
Oat-grass	<i>Danthonia spicata</i>
Orange milkwort	<i>Polygala lutea</i>
Orchard grass	<i>Dactylis glomerata</i>
Ox-eye daisy	<i>Heliopsis helianthoides</i>
Painted buckeye	<i>Ausculus flava</i>
Panic grass	<i>Panicum boscii</i>
Parrot feather	<i>Myriophyllum aquaticum</i>
Pawpaw	<i>Asimina triloba</i>
Pencil flower	<i>Stylosanthes biflora</i>
Pennyroyal	<i>Hedeoma hispida</i>
Persimmon	<i>Diospyros virginiana</i>
Phlox	<i>Phlox divaricata</i>
Pickering's morning-glory	<i>Stylisma pickeringii</i>
Pignut hickory	<i>Carya glabra</i>
Pink meadow beauty	<i>Rhexia mariana var. mariana</i>
Plantain	<i>Plantago virginica</i>

Poison hemlock	<i>Cicuta maculata</i>
Poison ivy	<i>Toxicodendron radicans</i>
Post oak	<i>Quercus stellata</i>
Prickly pear cactus	<i>Opuntia humifusa</i>
Purple vetch	<i>Vicia cracca</i>
Pussy-toes	<i>Antennaria plantaginifolia</i>
Quaking grass	<i>Briza minor</i>
Queen's delight	<i>Stillingia sylvatica</i>
Rabbit tobacco	<i>Gnaphalium obtusifolium</i>
Rabbit-foot clover	<i>Trifolium arvense</i>
Ragweed	<i>Ambrosia artemesiifolia</i>
Red cedar	<i>Juniperus virginiana</i>
Red maple	<i>Acer rubrum</i>
Red mulberry	<i>Morus rubra</i>
Red oak	<i>Quercus rubra</i>
Red pitcher plant	<i>Sarracenia rubra</i>
Red treasure lily	<i>Lilium gazarubrum</i>
Redbud	<i>Cercis canadensis</i>
Rose pink	<i>Sabatia angularis</i>
Rosin plant	<i>Silphium compositum</i>
Rosy tickseed	<i>Coreopsis rosea</i>
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>
Round-leaf boneset	<i>Eupatorium rotundifolium</i>
Round-leaf catbriar	<i>Smilax rotundifolia</i>
Rush	<i>Juncus marginatus</i>
Russian olive	<i>Eleagnus umbellata</i>
Sand thistle	<i>Cirsium repandum</i>
Sandbog beakrush	<i>Rhynchospora oligantha</i>
Sandhill milk-vetch	<i>Astragalus michauxii</i>
Sandhill morning-glory	<i>Stylisma patens</i>
Sandhill rosemary	<i>Ceratiola ericoides</i>
Sanicle	<i>Sanicula marilandica</i>
Sedge	<i>Carex debilis</i>
Sedge	<i>Carex frankii</i>
Sedge	<i>Carex howei</i>
Sedge	<i>Carex lupulina</i>
Sedge	<i>Carex lurida</i>
Sedge	<i>Carex superata</i>
Sedge	<i>Cyperus echinatus</i>
Sedge	<i>Cyperus retrofractus</i>
Sedge	<i>Cyperus strigosus</i>
Sedge	<i>Eleocharis obtusa</i>
Sedge	<i>Carex cephalophora</i>
Sedge	<i>Carex crinita</i>
Sedge	<i>Cyperus compressus</i>
Sensitive briar	<i>Schrankia microphylla</i>
Sensitive fern	<i>Onoclea sensibilis</i>
She-pea	<i>Clitoria mariana</i>
Shining panic grass	<i>Panicum lucidum</i>
Shortleaf pine	<i>Pinus echinata</i>
Sicklepod	<i>Arabis laevigata</i>

Silkyscale	<i>Anthraenantia villosa</i>
Skullcap	<i>Scutellaria elliptica</i>
Sleepy catchfly	<i>Silene antirrhina</i>
Slippery elm	<i>Ulmus rubra</i>
Smooth nutrush	<i>Scleria triglomerata</i>
Snakeroot	<i>Aristolochia serpentaria</i>
Sneeze-weed	<i>Senecio anonymus</i>
Sourweed	<i>Rumex acetosella</i>
Sourwood	<i>Oxydendron arboreum</i>
Southern red oak	<i>Quercus falcata</i>
Sparkleberry	<i>Vaccinium arboreum</i>
Spoonleaf seedbox	<i>Ludwigia spathulata</i>
Spotted wintergreen	<i>Chimaphila maculata</i>
Sticky foxglove	<i>Aureolaria pectinata</i>
Summer grape	<i>Vitis aestivalis</i>
Sundrops	<i>Oenothera fruticosa</i>
Sunflower	<i>Helianthus atrorubens</i>
Swamp dayflower	<i>Commelina virginica</i>
Swamp dogwood	<i>Cornus amomum</i>
Swamp skullcap	<i>Scutellaria lateriflora</i>
Sweetbay	<i>Magnolia virginiana</i>
Sweet-gum	<i>Liquidambar styraciflua</i>
Tall windflower	<i>Anemone virginica</i>
Thistle	<i>Cirsium vulgare</i>
Three-seeded mercury	<i>Acalypha rhomboidea</i>
Tickseed	<i>Coreopsis major</i>
Toad-flax	<i>Linaria canadensis</i>
Touch-me-not	<i>Impatiens capensis</i>
Tree of heaven	<i>Ailanthus altissima</i>
Turkey-foot grass	<i>Tripsacum dactyloides</i>
Venus' looking glass	<i>Triodanis perfoliata</i>
Verbena	<i>Verbena brasiliensis</i>
Vietnam grass	<i>Microstegium vimineum</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Wahlenbergia	<i>Wahlenbergia marginata</i>
Walter's violet	<i>Viola walteri</i>
Water oak	<i>Quercus nigra</i>
Water pimpernel	<i>Samolus parviflorus</i>
White meadow beauty	<i>Rhexia mariana var. exalbida</i>
White milkweed	<i>Asclepias variegata</i>
White oak	<i>Quercus alba</i>
White-topped aster	<i>Aster solidagineus</i>
Wild carrot	<i>Daucus carota</i>
Wild ginger	<i>Hexastylis arifolia</i>
Wild petunia	<i>Ruellia caroliniensis</i>
Wild radish	<i>Raphanus raphanistrum</i>
Wild savory	<i>Cunila origanoides</i>
Wild senna	<i>Cassia marilandica</i>
Windflower	<i>Thalictrum thalictroides</i>
Wing stem	<i>Verbesina occidentalis</i>
Winged elm	<i>Ulmus alata</i>

Winged sumac
Witch-hazel
Woodgrass
Woods iris
Wool-grass
Yellow baptisia
Yellow maypop
Yellow poplar

Rhus copallina
Hamamelis virginiana
Melica mutica
Iris verna
Scirpus cyperinus
Baptisia tinctoria
Passiflora lutea
Liriodendron tulipifera